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ABSTRACT

This book was created to honor Jules B. LaPidus, retiring president of the Council of Graduate Education, and to preserve his writings and speeches. The papers and speeches of Part 1 show how the author addressed the topical issues of graduate education, moving from observation to direction on research, funding, and preparation of faculty. Part 2 contains speeches and one additional paper aimed at students. Following a preface in which the Board of Directors of the Council of Graduate Schools express their appreciation of LaPidus, these papers are presented: (1) "A Christmas Parable"; (2) "The Professionalization of the Master's Degree"; (3) "Research and the University"; (4) "The Concern for Quality and the Quality of Concern"; (4) "Graduate Education: Perturbations and Prospects"; (5) "Humanizing Graduate Studies in the Humanities"; (6) "The Graduate Pipeline"; (7) "The Strain of Quality"; (8) "Preparing Faculty: Graduate Education's Role"; (9) "Great Expectations: The Role of the American University in the 21st Century"; (10) "Communities of Scholars: Research in the University"; (11) "Some Thoughts on the Relationship between Research and Research Universities"; (12) "A Place for Learning: The University and Society"; (13) "Deja Vu All Over Again"; (14) "Scholarship and Research: Graham's Law Revisited"; (15) "Ph.D.s and Jobs: A World They Never Made"; (16) "Doctoral Education: Preparing for the Future"; (17) "If We Want Things To Stay as They Are, Then Things Will Have To Change"; (18) "The Role of Theses and Dissertations as Independent Works of Scholarship"; (19) "Some Globalization Aspects of Graduate Education"; (20) "Broadening the Scope of Graduate Education: Postbaccalaureate Futures"; (21) "Is What's Past (or Post) Still Prologue? Or 'You Used To Be My Used To Was But Now You Ain't No More'"; (22) "Numbers Last: A Proposal for Improving Departmental or Program Based Graduate Admissions"; (23) "A Passion for Graduate Education"; (24) "An Atlas for Scholars"; (25) "Reducing the Deficit"; and (26) "The Corner of Your Eye." An appendix contains four tributes to Jules B. LaPidus by colleagues. (Contains 125 references.) (SLD)

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A Walk Through Graduate Education

Selected papers and speeches of Jules B. LaPidus
President of the Council of Graduate Schools
1984–2000

Edited by Jane A. Hamblin

Council of Graduate Schools
Washington, DC

Produced through the support of the Educational Testing Service and the Graduate Record Examination Board.

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—Jane A. Hamblin

Foreword

This book was created by the Board of Directors of the Council of Graduate Schools to honor retiring president Jules B. LaPidus and to preserve his writings and speeches, which have been thought by many in the higher education community to represent "cutting edge" thinking about graduate education even before it was stylish to be on the cutting edge.

At the beginning and the end of this walk through graduate education, the reader will find markers of the high esteem in which colleagues in graduate education hold the author of the works that follow. The preface presents the tribute of the Board of Directors. In the Appendix, included at the request of the Board, are the papers of Steadman Upham, Russell Hamilton, Catharine Stimpson, and Robert Rosenzweig that were delivered at the 1999 meeting of CGS and that provide thoughtful analysis of the author's scholarship and leadership of the Council of Graduate Schools.

In between, the writings themselves, presented chronologically over a 25-year span, wend their way insightfully and efficiently across the terrain of United States graduate education. The papers and speeches of Part One show clearly how the author met head on the intellectual traffic of graduate education, moving from observation to direction on research, funding, and preparation of faculty. The works in Part One can be read serially according to the time they were written, or they can be read for topical interest. Either way provides a splendid view of the graduate education landscape. The influence of scholars like Boorstin, Rosenzweig, Barzun, and Ziman is apparent in several of the works, and the reader will note occasional repetition, but fuller exploration of their thoughts at every turn.

Part Two contains speeches and one paper, all aimed at students and their obligations as leaders and thinkers. These are meritorious as reading not only for students but also administrators of graduate education.

For those who would be speech-writers or speech-givers, other paths can be followed. The author's approaches and methods of relating to any given audience are models of good practice.

A Walk Through Graduate Education shows where graduate education has been and where it is headed, leaving no doubt as to its importance in higher education.

—Jane A. Hamblin

Preface

The casual observer of higher education over the last decade would be hard pressed to identify graduate education as an area of interest to the broader education community. Instead, undergraduate education, faculty workload, institutional accountability, assessment and evaluation, and civic engagement are topics that have dominated the national education agenda. Yet, during this period, graduate education has been a stable and driving force within the academy. As we enter the new millennium, there is a growing recognition that graduate education is among the most important and successful aspects of the educational process, that the methodologies of graduate education are tested and proven, and that the products of graduate education—new professionals, new scholars, new knowledge—are among the most important achievements of the university.

One of the principal reasons for this growing recognition is traceable to the activities of one person in one organization—Jules LaPidus and the Council of Graduate Schools. Jules LaPidus, president of the Council of Graduate Schools for the last 16 years, has quietly but effectively guided the graduate ship of state during a period in which the higher education establishment focused on many other topics and activities. Jules galvanized the national group of graduate deans and graduate professionals by carefully explaining the fundamental aspects of graduate education and by elucidating the structure and operation of the American graduate school.

Any recounting of the development of higher education during the last 2 decades of the twentieth century would not be complete without a significant disquisition on the impact of Jules LaPidus. The effect of his activities is clearly seen in graduate schools across the country and around the globe. We now see in other countries major activities to build a graduate enterprise that mirrors the American structure. This circumstance is directly linked to his ideas and philosophy and to the influence of his scholarly writing on graduate education.

It is thus with enormous pride and pleasure that we offer as a tribute to Jules this compilation of his writings. It provides a map of his many ideas and documents a portion of his contribution to the academy. The publication is an expression of the tremendous respect and admiration that he elicits from his colleagues.

It is said that if we see farther today it is because we stand on the shoulders of giants. Jules LaPidus is one of those giants. We all see farther and more clearly because of his important thinking on graduate education.

Carole Beere
Chair of the Board of Directors
of the Council of Graduate Schools
Vice President, Walden University

Steadman Upham
Immediate Past Chair of the Board of
Directors of the Council of Graduate
Schools
President, Claremont Graduate University

COUNCIL OF
GRADUATE SCHOOLS

Part One

A CHRISTMAS *parable*

Once upon a time a little boy lived with his poor but honest parents. He was a bright little fellow interested in everything around him and eager to learn about the world. Christmas was approaching, and Mother and Father were often seen to look anxiously at each other as their son chattered about all the lovely things he hoped to find under the tree. They tried to explain to him that Father was just a humble bookkeeper who worked for a stingy old man, and that times were hard and getting harder. He listened and said he understood, but at night, in his cold little bed, he couldn't keep back a few icy tears.

In December of 1973 this memo was written as a commentary on indirect costs to the provost by the new associate dean for research in the graduate school at The Ohio State University.

One evening, as the family was sitting down to their meager dinner, they were startled by a loud knock at the door. "Who can that be," said Father, as he went to the door. The door opened to reveal a jolly old man, snow glistening in his white beard and on his red cheeks. "Why, it's Uncle Sam!" cried Father.

A place was quickly made at the table, and for a little while, warmth and genial good cheer filled the little kitchen as Uncle Sam told wonderful stories about his travels and all the exciting things he had seen and done. Later, as they sat around the fire, Uncle Sam took the little boy on his knee and said, "Well, my boy, and what would you like for Christmas?"

"Oh, sir, I would like some electric trains and an encyclopedia, but . . . but," and with a stifled sob, the little fellow ran from the room.

"What is the matter?" asked Uncle.

"Well, Sam," said Father, "what with hard times and all, I'm afraid we can't afford to buy any presents this year."

Uncle Sam nodded, and after a few moments said, "What would you say if I gave you the money to buy that encyclopedia and those trains?"

Mother burst into tears and was comforted by Father, while Uncle Sam got very red and harumphed, and took out his big handkerchief and blew his nose.

After everyone had calmed down, Father, after a few false starts, said he had something to say.

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"Sam, we can't tell you how grateful we are for what you want to do. It will make us all so happy, but there are a few problems, and since you are a man of the world, I know you'll understand. If we buy that encyclopedia, it will take up some space in our house. In addition, we will probably use more electricity since there will be more to read. Of course, the same is true for the trains. They will take up floor space, use electricity, and we'll probably have to increase our insurance. In other words, there will be a lot of indirect expenses to us after we buy these things. I don't want to sound ungrateful, but I think we really need some extra money to cover these 'indirect costs.'"

For a while, Uncle Sam said nothing, but just rocked and looked thoughtfully at the fire. Finally he said, "Nephew, you have been a bookkeeper too long, I fear. Tell me, what will you do if I cannot give you the extra money?"

"Why, we'll simply deduct some of the funds you give us and use them to pay the indirect costs," said Father. He quickly got out pencil and paper and after figuring furiously for a few minutes, said, "If we leave out the caboose and one car from the train set and also omit the last four volumes of the encyclopedia, I think we can just do it."

Uncle Sam rose, put on his greatcoat and muffler and tall top hat and went to the door. "Sometimes," he said, "I think we know the cost of everything and the value of nothing." And with that, he left.

Mother and Father looked at each other as they stood by the dying fire. The little boy cried himself to sleep in his tiny room.

And they all lived happily ever after?

THE PROFESSIONALIZATION *of the master's degree*

The master's degree, in its various forms, shapes, or guises, invariably is a topic of discussion at gatherings of graduate deans. Whatever our diversity, the common thread that runs through all our institutions, large or small, public or private, urban or rural, is this first and most protean graduate degree. You will recall that the Council of Graduate Schools some years ago differentiated between academic and professional master's degrees. The purpose of the academic degrees (i.e., Master of Arts, Master of Science) was to introduce the student to scholarship and research and to serve as a basis for advanced study. The professional degree, usually tagged with some terms identifying the profession (e.g., Master of Business Administration) was intended to prepare the student for professional practice. If that last definition sounds somewhat strange, it may be because it refers to a simpler time, a time when undergraduate studies were not regarded so much as vocational training as general education. It is still not unusual for people entering professional masters programs to have their undergraduate degrees in fields quite different from that of the graduate major. This is usually not the case in the academic masters programs.

This speech, given at the Midwestern Association of Graduate Schools meeting in March 1976 in Chicago, urges graduate school administrators' attention to the development of professional graduate education, portending the needs of industry and students for professional training.

The major difference between the two types of degrees is that the professional degree relates primarily to a profession (or even more specifically to a job) while the academic degree is concerned with a discipline or field of study. The focus that is provided by the profession in the first case is provided by the thesis in the second. But, there is a problem with that last sentence. During the last 10 years, the ratio of thesis to nonthesis degrees has turned around so that today, at my university, roughly 70% of all students in masters programs elect the nonthesis option. I suspect that the same sort of thing has happened in your institutions. Why? There may be many reasons.

I think that one reason is the increasing professionalization of the academic master's degree as a direct result of increasing pressure from working professionals for additional credentials. There has been a dramatic rise in interest in professional master's degrees. Except for the few more-or-less standard, tagged degrees, however, this process is taking place within the context

of the academic degree, and a sure sign of it is the increase in the number of nonthesis degrees. Another sign is the increased amount of time and academic credit given to "field-based" experiences. De facto professional programs seem to be more and more concerned with ensuring to prospective employers that the recipient of an advanced degree is a finished product for whom the university has assumed the responsibility for both academic and on-the-job training. As stated recently in *Outlook and Opportunities for Graduate Education,* published by the National Board on Graduate Education, "the award of nonthesis master's degrees may have been based on sound educational policy but in practice has contributed to the denigration of the degree" (National Board on Graduate Education [NBGE], 1975, p. 65). The problem with the nonthesis M.A. or M.S. is that the focal point has been removed. What was a program easily becomes a collection of courses often with little relation to each other or anything else, but which leads to a certificate that can be used as a criterion for advancement in fields where it is often difficult to discern any relationship between educational preparation and practice.

Universities, particularly graduate schools, are going to have to clearly define their professional and academic programs. They must also recognize that, with respect to the professional programs, a totally different approach will have to be developed.

The question of entry to these programs is often fraught with emotion. There is little doubt that undergraduate performance is related to graduate performance in academic programs where there is continuity in subject matter. In professional programs, however, ability as an undergraduate may have little or nothing to do with professional competence. Professional practice itself may be the most relevant entry criterion.

We will be dealing with a much different group of people. For one thing, they will be older. They will have been working in jobs that require the bachelor's degree, and they will be concerned about security and advancement. For the most part, they will see the acquisition of a master's degree as the key to a better life. Since they will be working, they will want programs that offer the possibility of degree completion on a part-time basis with all courses given after 5 p.m. and on weekends. This is where it is particularly important for universities to deal with the concept of program, since the opportunity to accumulate credits according to what is available is accentuated for part-time students and can result in a hodge-podge of courses without much coherence or relationship to degree requirements.

Students enrolled in professional programs are much more likely to come from the local community than are graduate students in academic programs. Institutions within a state but in different cities are really not competing with each other in their professional programs. The question of need is valid, but the question of duplication is simply not relevant.

Graduate schools cannot become credentialing mills. At the same time, they cannot ignore the educational needs of vast numbers of people. If we are to be seriously involved in professional graduate education, we must answer many questions. Is a structured academic experience the best way to enhance professional performance? Should universities be involved at all? What is the role of practitioners as teachers? Perhaps most important—does it make any difference? Can anyone tell the differences between those who have been through the program and those who have not? If there is no way to provide these programs in a manner that is reasonable and academically valid, then universities should not be involved. On the other hand, if we are idealistic enough to believe that our academic colleagues who work in these disciplines can design programs that will actually have a positive effect on the level and quality of professional practice, then we should proceed as rapidly as possible. This is particularly true for institutions located in urban areas with high concentrations of professionals who are finding it more and more necessary to get a master's degree if they are to advance professionally. A responsibility of graduate schools will be to establish guidelines that will facilitate the development of these masters programs.

Outlook and Opportunities for Graduate Education (NBGE, 1975) stressed that the master's degree is a "locus for experimentation with new degree programs and new degree audiences," and suggested, "Many of the potential new students are less interested in research careers than in continuing education and appropriate certification" (p. 65). An additional and appropriate quote from the same source states:

> We strongly believe that excellence in scholarship, research, and graduate education, where it currently exists, should be maintained and enhanced, and that graduate programs with an applied, practitioner focus, serving the needs of new clientele groups with different interests from the traditional doctoral student must also be provided. (NBGE, 1975, p. 20)

In many quarters, universities have come to be viewed as vocational training schools. There is a more philosophical view of the university as the place in society that is the repository of the knowledge that defines and illuminates a civilization and where that knowledge is passed on to new generations who try to understand and expand upon it. We encounter serious problems when we try to define the university as being one or the other. It is becoming apparent that some institution in society will have to assume the responsibility for the training of professionals who carry out their work in a world that is becoming increasingly complex. This training will most often be focused on specific kinds of problems, and most of the problems with which we deal today require the application of knowledge and skills from a variety of fields. Consequently, what will be necessary is the formation of coalitions of professors and practitioners who, must, by example of their own effective interaction, provide a useful model for the education and training of students.

RESEARCH *and the university*

Written in the late 1970s, this piece ran in an Ohio State University newsletter on research. The importance of the graduate school as a place of learning is at the forefront.

At a meeting I attended recently, we were reminded of the counsel offered by Francis Bacon more than 300 years ago when he wrote that we must "from experience of every kind first endeavor to discover true causes and axioms; and seek for experiments of Light, not for experiments of Fruit. For axioms rightly discovered and established supply practice with its instruments, not one by one, but in clusters, and draw after them trains and troops of works" (Bacon, 1937, p. 61).

These words seem particularly appropriate today when a public, often confused by the difference between science and technology, has great difficulty in understanding why university scientists and scholars must be encouraged and supported in that pursuit of knowledge, those "experiments of light," usually called basic research. My agricultural colleagues tell me that where there is no light, there can be no fruit. Without carrying the metaphor further, it is apparent that while we may have the knowledge and understanding in some areas to find the right answers, in other areas we cannot even ask the right questions.

Inherent in the definition of basic research is the concept of seeking knowledge for its own sake. At the same time, however, it is clear that as the total range of knowledge increases, our ability to translate theoretical possibility into practical reality is greatly enhanced. Several studies have been published recently that identify major advances in a number of fields and then analyze the articles in the scientific literature that have served as the basis for these advances. In all cases, basic research, research that, at the time it was done, had no goal other than to advance knowledge, was found to be the most frequently cited source material.

It is important to recognize that these studies have been retrospective. We can point to the work of Galileo and Copernicus, Newton and Einstein in making a landing on the moon a reality, but their work was not done for that purpose.

Harvard president Derek Bok wrote recently that even a brief reduction in funding for basic research could have long-lasting effects that will hinder science programs. On the other hand, he pointed out, crash programs are inefficient and

should be used only in dire national emergency. They buy time at high cost, and later efforts to catch up would be wasteful and inefficient, because they would replace orderly, sequential discovery with intense parallel efforts.

Like most research universities, we are involved in a wide range of scholarly activities as part of our role in society. There is no conflict between basic and applied research, no conflict between teaching and research. What there is, and what there must be, is an overriding dedication to learning. For where learning is, "trains and troops of works" will follow.

THE CONCERN FOR *quality and the quality of concern*

The state of elementary and secondary education in this country has led many to believe that we are not "Making the Grade," and are, in fact, "A Nation at Risk." Among other things, this has resulted in "A Call for Change in Teacher Education." Teacher education takes place primarily in colleges and universities, and those are precisely the places where we need to infuse "Integrity in the College Curriculum" so that we foster "Involvement in Learning" in order "To Reclaim a Legacy." All of this concern is salutary and brings to us in the graduate part of the enterprise a considerable challenge. But even we have noticed "Signs of Trouble and Erosion" and are particularly worried about "Scholarship and Its Survival."

Presented at the 27th Annual Meeting of the Western Association of Graduate Schools in Honolulu in March 1985, this talk draws together several national reports on the state of higher education and offers a theme that will recur in later writings—the quality of graduate education.

I am sure that you recognize most of the phrases in the preceding paragraph as titles of reports that have been written during the last 2 or 3 years, all of them concerned with and expressing concern about the quality of education in the United States. I plan to examine that concern for quality and the quality of that concern. Before doing so, I need to make a linguistic aside and point out that concern and quality are words that have several different meanings, and I have used most of them already.

For the most part, when people speak about the quality of something, they are referring to how good it is (or how good somebody thinks it is). That implies some kind of quantitative evaluation related to a continuum, where some things are good, some things are bad, and some things fall on points in between. Also, it generally implies some comparison. In addition, however, there is the implication that good or bad is relative to some internal standard, some understanding of the essential nature of a thing. A good apple is one that has a lot of appleness, one that possesses the qualities that define applehood.

To talk about how good something is, it is necessary to define what it is. A particularly good example of this has to do with the quality of academic programs.

Some years ago, the Council of Graduate Schools, in cooperation with the Council on Postsecondary Accreditation (1991), issued a statement on

accreditation of graduate programs. In that statement, two kinds of graduate degree titles were defined, Research Oriented and Practice Oriented. I want to expand both of those definitions in the following ways: First, when the focus of a degree program is the state of practice in a profession, then the objective is to advance the state of practice by preparing exemplary practitioners. Second, when the focus is the state of knowledge in a discipline, or set of disciplines, then the objective is to advance the state of knowledge and to prepare exemplary scholars. With these definitions in mind, let's talk about graduate education.

The 1983 report *Doctorate Recipients from United States Universities* (National Research Council, 1983) listed some 47 different doctoral degrees, and although the Ph.D. represents the vast majority of these degrees, most of the others are part of graduate education and so form part of our concern. These other degrees, the Ed.D., D.B.A., D.S.W., Psy.D., and others, generally fall into the category of practice-oriented degrees and must be evaluated that way. That seems reasonably clear. What is equally clear is that in some cases, the Ph.D. has become indistinguishable in substance from some of these other degrees. Whether that is good or bad may depend to some extent on your point of view. I give you an example.

Several years ago, I was asked to participate in a graduate seminar and to talk about dissertation proposals—more specifically—what made a good dissertation proposal. The students were all doctoral candidates. I started by asking how they defined a dissertation. Finally, I offered this proposal: You can consider a dissertation a piece of scholarship with a life and integrity of its own. Or you can consider it a degree requirement in which the substance is not as important as the form, in which the product is not as important as the process. If you believe it is the former, then one question about a dissertation proposal is always the same regardless of field: Why is this a significant piece of research and what are its implications? If you believe it is the latter, then that particular question is irrelevant. There would be other, appropriate questions that would have to do with techniques, methodology, bibliography, and so on. In this second case, one could propose a methodologically exquisite piece of work dealing with a totally trivial topic.

I found the class' opinion divided, and since I made my bias explicit (I favored the first definition), some students left the classroom clearly disturbed. It was, as they say, a learning experience for all concerned. For all of that, however, I believe that most graduate educators would agree with me in defining the quality of Ph.D. programs. Certainly the reports and evaluative studies of doctoral education do. They insist on the integral relationship between graduate education and research, and they evaluate graduate programs in terms of the scholarship and scholars they produce. We cannot evaluate all doctoral

programs that way, but we should be able to evaluate all Ph.D. programs on that basis.

The situation with respect to masters programs is much more complex. Part of this has to do with the sheer magnitude of the enterprise. Close to 300,000 master's degrees are awarded each year in the United States, compared to approximately 30,000 doctoral degrees. We do know that in contrast to 30 or 40 years ago, most of these master's degrees do not require a thesis. That being the case, research cannot be the *sine qua non* of masters level education today. Clearly, masters programs are not miniature Ph.D. programs. But what are they? There seems to be a great deal of confusion on this point. Some master's degrees are no longer considered part of graduate education, but are classified as professional degrees. This is often the case with degrees other than the M.A. and M.S., and the final distinction as to whether the M.B.A., M.S.W., M.F.A., M.S., and related degrees are graduate or professional degrees may ultimately be made on the basis of the administrative structure of the university and its graduate school. But these are mainly considerations of form, and I would rather talk about substance. Most of the master's degrees in this country, regardless of title, are practice oriented, and as such are focused by the state of practice in particular professions. For the most part, they do not involve research, and while they may be organized around the base of knowledge in a discipline or, more likely, a set of disciplines related to a profession, they are seldom concerned with advancing that knowledge base in a direct way.

The proliferation of master's degrees titles seems to be limited only by the wants of a credential-hungry public and the willingness of universities to accommodate those wants. An interesting example of this is an announcement in Washington, DC, a few weeks ago of a degree called Master of Association Management. When you consider that the third largest industry in Washington, after the federal government and tourism, is the association industry, it is not difficult to understand the demand for this kind of credential and the response to that demand.

There probably are 1,000 to 1,500 different master's degree titles. Some are used only in one institution. New ones are being developed every day. Just keeping track of them is a problem. Trying to evaluate or understand them can be a nightmare. The definition I proposed earlier will help but leads inescapably to the need to define what is meant by advancing the level of practice in a profession. Compared to that, evaluation of the Ph.D. programs is relatively simple. Recently, some state controlling boards have begun to ask graduate educators to try and define masters education. It is time for us take on this awesome task.

Is there anything that characterizes all of graduate education? Let me suggest that graduate education is focused study at an advanced level.

But if graduate study is advanced, what is basic? It is becoming increasingly clear that what is basic is not specialized training but general education. In fact, the single most important issue in graduate education in the United States could be that the traditional assumption upon which it rests—that is, that individuals coming to it can read and write English, have some grasp of quantitative relations, and have been exposed to the important ideas and conflicts of ideas that have shaped the way we think about the world—is no longer valid.

If that is correct, and some of the reports mentioned earlier argue strongly that it is, how does the educational community respond? Short-term solutions usually involve lowering the level of graduate education to make up for insufficient preparation, coupled with increasing specialization at the undergraduate level (and for that matter, at pre-college levels) to prepare people for specific careers rather than to educate them. Ultimately, we need to face the long, hard job of defining and improving the quality of education and to recognize that the entire educational system is better depicted by a circle than by a line, and that what happens in one part affects all the others.

Several of the recent reports have deplored the state of liberal learning in our undergraduate colleges and have urged a variety of remedies, some involving the graduate school. In particular, the 1985 report of the Association of American Colleges (AAC), *Integrity in the College Curriculum,* and the 1984 report by Secretary of Education William Bennett, *To Reclaim a Legacy,* both drew a bleak picture of the current state of things and of the effect graduate schools have had on undergraduate education. The AAC (1985) report said it this way:

> Central to the troubles and to the solution are the professors, for the development that overwhelmed the old curriculum and changed the entire nature of higher education was transformation of the professors from teachers concerned with the characters and minds of their students to professionals, scholars with Ph.D. degrees with an allegiance to academic disciplines stronger than their commitment to teaching or to the life of the institutions where they are employed. As appropriate as research is as a focus of energies and resources in the research university, the exclusive concern with research in the training of recipients of the Ph.D. degree—to the neglect of any concern with teaching or with any professional responsibility other than to scholarship—has encouraged college faculties to abandon the sense of corporate responsibility that characterized professors of the pre-professional era. (p. 6)

Mr. Bennett (1984) said it this way:

> Training good researchers is vital to the humanities and to the mission of every graduate school. But many graduate schools have become so preoccupied with training narrow specialists that they no

> longer address adequately the more pressing need of higher education for good teachers broadly versed in their fields, inspired by the power of their subjects, and committed to making those subjects speak to the undergraduate. Unless our graduate schools reexamine this misplaced emphasis, much of our teaching will remain mediocre and students indifferent. (p. 19)

There are some interesting undercurrents in these two very similar statements. One is a pervasive nostalgia. In the good old days, college professors cared about their students. Further, professors were broadly educated people who illuminated the lives of their students with the genial light of their erudition. Today, preoccupation with scholarly things has made them insular technicians, concerned with survival, replication, and advancement.

Another undercurrent is that the graduate schools are doing a good job training scholars—so good that these scholars have forgotten everything but the clarion call of their respective muses. Finally, there is the tacit assumption that students today are as eager to learn and as prepared to learn as they ever were, and that better preparation by professors would signal a return to those halcyon days of yore, with Mark Hopkins on one end of a log and an eager, receptive, and prepared student on the other.

This all paints a glowing picture of the past, a dismal one of the present, and a pessimistic one of the future, depending, to some extent, on what the graduate schools decide to do about it. No one, at least as I read the reports, is suggesting that graduate schools lower their standards for scholarly work as a necessary condition for a rebirth of the concept of general or liberal education. What is being suggested is that undergraduate education be changed, and that faculty members assume a responsibility for undergraduate education that transcends the boundaries of their disciplines. To that let me add that graduate deans, along with other academic administrators whose responsibilities are university-wide in scope, have a responsibility for initiating and sustaining activities that will foster that kind of collective action.

How do we change undergraduate education? Secretary Bennett suggested, among other things, that the appropriate background for all students involves consideration and study of the great books of Western civilization.

The AAC (1985) report suggested several approaches. Instead of recommending authors or courses, it laid out a conceptual map of the world of the mind in which no terra is incognita: inquiry, literacy, understanding numerical data, historical consciousness, science, values, art, international and multicultural experiences, and study in depth. All in all, an excellent, wise, and comprehensive view of the nature and purpose of the baccalaureate degree.

The AAC (1985) report then cited "the failure of the graduate schools to prepare holders of the doctorate degree for careers in teaching" (p. 35),

described teaching assistantships as "a device for exploiting graduate students in order to relieve senior faculty from teaching undergraduates" (p. 35), and ended by recommending that the Ph.D. degree should "mean that the candidate has been evaluated as a teacher and not found wanting and that the formal experience leading to the degree has included appropriate instruction in the responsibilities of the profession" (p. 36).

Wait a minute. Evaluation by whom? Appropriate instruction by whom? The senior faculty who, according to the report, have been avoiding teaching undergraduates? The TAs? The School of Education? The report provides no good answer except to say that the problems and the solutions are in the hands (and minds) of the faculty.

Suggestions about improving the quality of teaching and learning also have been made in the National Institute of Education (NIE, 1984) report called *Involvement in Learning: Realizing the Potential of American Higher Education.*

The NIE report suggested that graduate schools can influence the quality of undergraduate education by paying more attention to the liberal education background of graduate school applicants and by developing mechanisms whereby graduate students contemplating careers in teaching have some opportunity to become involved in the teaching process as graduate students. These are reasonable suggestions.

From its place in the title to its pervasiveness in the various sections, the word "involvement" is the touchstone of the NIE report. Early and continuous involvement of students and faculty in learning, with both parties taking active roles, is encouraged throughout. Particularly striking to me was the second recommendation, "Faculty should make greater use of active modes of teaching and require that students take greater responsibility for their learning." (NIE, 1984, p. 27). This is to begin at the freshman and sophomore level (a concept called front-loading). College faculty are urged in this recommendation to:

involve students in faculty research projects;
encourage internships;
organize small discussion groups;
require in-class presentations and debates; and
create opportunities for supervised independent study.

This is striking because it is familiar. It describes what usually happens in graduate school: involvement in research, independent studies, seminars, debates, passionate arguments about the subject matter. These are the day-to-day activities of graduate students and faculty. The involvement does indeed enhance the quality of learning and teaching for all involved. Why does this work well in graduate education? Graduate school admission is usually highly selective. Entering students have been required to demonstrate knowledge and

aptitude for advanced study, and one expects that they are there because they are interested. Students choose departments because they have high expectations and perhaps some evidence that the faculty in those departments are deeply involved in the subject. Everyone expects to be pushed, to be extended intellectually, often a little further than is really comfortable. It's a two-way street and there are powerful incentives on both sides. The reward structure is such that advancement and professional recognition come to those who are most active, most involved, who contribute the most. This applies to faculty and students alike.

Is this transferable to undergraduate education? Certainly it is for those institutions that have established the kind of learning environment just described. But the situation is often quite different, particularly in large universities where the costs of this kind of education would be enormous.

All of these reports express an intense concern about the quality of education in the United States today. The essence of the concern—the quality of it—was probably expressed best by Robert Hutchins (1936) in *The Higher Learning in America*, where he pointed out the difference between education and training and warned of the consequences of turning our colleges and universities into vocational training schools.

I don't believe that we want to recapture anything. I do believe that we need to learn from experience and move ahead, not backward. I believe that as graduate educators, we need to be concerned about advancing the state of knowledge in the disciplines, about advancing the state of practice in the professions, and through these activities, about advancing the state of education in the United States.

GRADUATE *education: perturbations and prospects*

Today, I plan to take a long view of graduate education and to discuss with you some of the important issues that have affected and that will affect graduate education in the United States.

How far back do we go? Not quite to the beginnings of graduate education in the United States (at Yale or Hopkins, depending on your point of view). Not to the slow growth and development of graduate programs during the early part of this century, with relatively few students seeking advanced academic degrees, and with those who did approaching the prospect of graduate education much as one might approach entering a monastery—complete with vows of poverty. Perhaps a good starting point would be World War II. Not as a starting point for the ideas of scholarship, research, and advanced study, but rather as the beginning of a set of perturbations in the way we think about those things.

This speech was first prepared for The Ohio State University Senate in April 1984. In 1985, as the new president of the Council of Graduate Schools, the author presented a "nationalized" version to the Northeastern Association of Graduate Schools Annual Meeting in Princeton, New Jersey. The historical perspective of graduate education and its role in society makes this an interesting read.

Before the Second World War, many of the best American scholars were going to Europe, particularly Germany, Italy, France, and England, to study. They were foreign students. This paralleled the course taken by aspiring American artists and musicians who, like scientists and humanists, went to Europe for the training, for the tradition, and for the opportunity to be immersed in a culture that had developed the intellectual contexts and the performing styles for artists and scholars alike. That changed dramatically in the 1930s. In fact, scores of European scholars, artists, and intellectuals of all types left Europe if they could to seek freedom—religious freedom, personal freedom, and academic freedom to pursue their work.

In America, a country slowly mobilizing for war, we discovered that we had not paid enough attention to scholarship, particularly in the sciences, and we needed knowledge and knowledgeable people quickly. In a fantastic spurt of creative activity, fueled as usual by necessity, we created a science establishment without parallel. The Manhattan project is only one example. Scientists around the country were besieged with offers of federal support to continue their work if that work was related to the war effort. American scientists found themselves involved in making better drugs, better engines, better vehicles, better

communications systems, better materials, and finally, better bombs. It was a triumph of technology and, as usual, had tremendous consequences for basic research. Research on finding new chemicals for the war inevitably led to new information about chemistry. The same could be said for physics, mathematics, biology, psychology, and many other fields. We came out of that war with a new science establishment in the United States. Big science was here to stay.

The postwar period was a paradise for American universities. Millions of veterans, encouraged by the G. I. Bill, went to college and graduate school. Higher education was no longer a perquisite of the wealthy. The birth rate was rising, business was good, and universities were expanding. It was a period without precedent in American history. It produced, among other things, the notion of mass higher education extending even to graduate school, and, by the way, much of the knowledge base for the revolutions in biology, information science, and almost everything else that we view today with pride, with terror, and with indecision.

We know more. We have more options. Our dilemmas have multiplied.

But let's go on. For those of us who were graduate students in the late 1940s and through the 1950s, particularly in scientific disciplines, it was a great time. We had support, we had equipment, we had jobs. Let me dwell on that for a moment. I was a graduate student in medicinal chemistry from 1954–58. I never knew another graduate student who was worried about getting a job after graduation. The only question was—academic or industry. Both were abundantly available.

I could spend much more time on this period, but instead, let me leave it with this thought. The majority of the American professoriate today—and administrators as well—came through this absolutely unique period thinking that this was the way the world was. They were right, it was. But it isn't any more.

Gradually, as the imperatives of "THE WAR" faded, we moved into a relatively quiet period. The Korean War, strangely enough, did not have a major effect on universities except perhaps to begin to sensitize thinking people to the entire process of international relations mediated through intimidation, and to extend the G. I. Bill. The Cold War was on, and during all this time another issue was seething. Slowly and painfully we began to cope with inequities in American society, particularly with respect to racial minorities, women, and the economically and educationally disadvantaged.

Then came Viet Nam and the revolutions on American campuses that characterized the late 1960s and early 1970s. Somehow the glowing phrases about scholarship and the life of the mind seemed tarnished by the harsh realities of life and death in a world we never made and could not understand. What were the effects on higher education? First, relevance became a rallying cry and was used to mean "that which was most immediately useful." Second, in a rush of enthusiasm to understand the underprivileged in our society, many people equated poverty and ignorance—a relationship that has no basis in fact—

and proceeded from there to equate anti-intellectualism with egalitarianism. That led, in Yale president Bartlett Giamatti's wonderful phrase, to universities spearheading the "institutionalization of incoherence." Suddenly students and faculty members were trying to demonstrate that all opinions were equally valid as long as you were sincere, that everyone was equal and was supposed to remain so, and that learning was not related to life. A devastating effect of this period was the demeaning of the value of education and the decline in literacy.

Coupled with all of this was Sputnik. When that satellite first flashed around the globe, America was caught flat-footed and earth-rooted. Once again, we found that we had forgotten about education and scholarship as long-term investments for this country. As in World War II, we mobilized to win. Science and engineering were national priorities and we accomplished a technological miracle. In July of 1969, an American walked on the moon.

We had won. The battle was over.

Boeing closed in Seattle. The space program stopped. Scientists and engineers were laid off in droves. The newspapers were full of stories about physicists driving taxi cabs. Students, their parents, and school counselors got a very clear message from this. The message was reflected in declines in enrollment in science and engineering. The Congress got a clear message too. National investment in education and research was to support short-term goals. Once those goals were achieved, we could go back to business as usual.

There were other effects that were not as obvious. The American public was confused. People believed that all of the work that needed to be done to put a man on the moon had been done in a few years as an exercise in American ingenuity. Everyone forgot about Galileo and Copernicus, Newton and Einstein, and all the other scholars who had laid the necessary foundation. We confused scholarship with research and research with development. We confused science with technology and education with training. We created a system that encouraged everyone to go to school, but provided support to schools based only on quick responses to short-term goals. We trained people to get us to the moon, and when that had been done, many found they had no place else to go.

Now we are in a new cycle. We have discovered—once again—that something is wrong. Actually, it seems quite familiar, quite like Sputnik all over again, but this time the game is international economic competitiveness—a game we have always won in the past, but one in which the players and ground rules have changed almost without our realizing it. Suddenly, we are being challenged by people whose languages and cultures few of us understand and whose countries we may not be able to locate on the map. We are responding in a number of ways, many involving education and particularly that part of education represented here today—graduate education.

Perhaps at no time in the last 50 years has there been as much public and professional concern about the quality of education. You all have seen the

reports and read their ominous titles: *A Nation at Risk* (National Commission on Excellence in Education, 1993), *Making the Grade* (Wood, 1983), *Signs of Trouble and Erosion* (National Commission on Student Financial Assistance, 1983), Scholarship and Its Survival (Pelikan, 1983), *Integrity in the College Curriculum* (Association of American Colleges, 1985), *To Reclaim a Legacy* (Bennett, 1984).

There are several themes running through these reports that bear directly on graduate education. Those that are concerned specifically with graduate education tend to define it rather narrowly as doctoral education in the arts and sciences and go on to deplore the lack of support for students, faculty, equipment, libraries, and other related and relevant items. Of particular note is the contention that many of the best and brightest American students no longer are going to graduate school, particularly in the arts, humanities, and sciences. This is seen as producing not only a decline in the quality of scholarship, but a crisis in the professoriate. Large numbers of current faculty employed in the boom times of the 1950s and '60s will retire in the '90s, just as the demographers predict an upturn in enrollment. Michael Sovern, president of Columbia, wrote recently that if too many of America's best shun graduate school, who in the next century will be there to open up young minds and to light the way to new discoveries, to teach humanities and history?

This is particularly sobering in view of the opinion expressed by the report of the Association of American Colleges (1985) that the trouble with American undergraduate education is American graduate education, and that the faculty have become so involved in scholarly pursuits and so discipline-directed that they have turned away from their role as the kind of teacher Mr. Sovern seeks.

It seems that from the perspective of graduate education, we are pointing the finger at pre-graduate education for not instilling youth with the proper values to lead them to seek careers as academics, and from the perspective of pre-graduate education, the finger is pointed at us for not preparing better teachers and teachers of teachers. Only Pogo could resolve that one with the immortal line "We have met the enemy and they is us!!"

Ignored in all of this is any coherent national discussion of the master's degree and its role in a society that increasingly demands this kind of credential to hold a job or keep one. No one is quite sure about the total number of master's degree programs being offered in this country today, but a conservative estimate would be somewhere near 1,500. It is often difficult to relate the substance of many of these degrees to either professional or academic rationales.

There is a new spirit of cooperation among universities, industries, and the federal government. All across the nation universities are seeking active working relationships with business and industry. Some of these ventures are truly innovative and have a good chance of producing long-term advancement of university, industry, and national goals. Many, however, will divert universities from their educational and research activities into becoming the R & D arms of

any industries willing to pay the price. I remember reading an article in which university faculty members and administrators were urged to think and talk like business executives to foster good working relationships. Some are doing just that.

Not unexpectedly, corporations, feeling the need to train their own employees, are getting into the education business in a big way, as mentioned in a forthcoming Carnegie Foundation publication entitled *Corporate Classrooms: The Learning Business* (Eurich, 1985). Some of these organizations have obtained degree-granting authority even at the Ph.D. level.

It seems strange to see universities being urged to get into applied research and development while industry gears up for educating its employees. There might be a market for a jointly taught workshop or halfway house for budding corporate educators and university industrialists, each trying to learn how to talk and act like the other. Here, as in the general concern for educational quality, there seems to be some confusion about who does what to whom.

There is little confusion emanating from the White House, however. The Reagan Administration has been nothing if not consistent in its actions regarding America's schools. The federal government clearly is attempting to reduce its role in the support of universities, primarily through reduction in its support for students, faculties, libraries, equipment, and other related items. There is no reduction in support for massive projects, particularly if they are defense-related and fall under the general title of "high tech." There is not so much enthusiasm for "high sci," particularly at the individual investigator level, and almost no one ever mentions "high schol."

Obviously, there are exceptions to this. The Presidential Young Investigators Program of the National Science Foundation is a serious attempt to recognize some of our brightest young scientists and engineers and to provide them with enough incentives to stay in academia where they can have the multiplier effect that results from keeping people like them in contact with bright young students. We can only hope that the federal, industrial, and academic partners in this exciting program will have the good sense to recognize that the primary payoff is not this year's consulting arrangement or next year's industrial research contract, but instead the stream of people and knowledge that will come from departments invigorated by brainy people pursuing their own ideas.

Finally, there is the new role of the states. Clark Kerr (1964), former president of the University of California, speaking recently at a meeting on the role of governors in higher education, told his audience that for at least the next 30 years, new initiatives and new money for colleges and universities will come from the states instead of from Washington.

There never has been much question that the states exert a dominant role in educational policy and development in the United States. In the absence of a national ministry of education, the establishment of new institutions and new

programs, as well as the demise of either of these, has been largely a state controlled function. During the past few years, there has been a new aspect to this with more governors becoming directly involved in efforts to develop major research universities where none exists and to strengthen them where they do. The reason is quite clear—economic development and the realization that the presence of major universities can enhance the development of business and industry in a state.

This new spirit of optimism and cooperation has all of the usual attributes of government-university-industry relationships. In almost all cases, the research emphasis is rather applied, the time line for results is rather short, and the expectations in terms of local economic growth and development are rather high. We will have to keep track of these interesting experiments.

Most notable, perhaps, is the recent interest in some states in setting up matching funds to create endowed chairs. At least ten states have made such commitments, and this represents a longer-term view of the role of universities and the need for states to see that they flourish.

All of the examples I have cited are part of a constantly changing view of universities and their relationship to society. Research is done in many places. So is teaching. But universities are the only places where scholarship and society really coexist in a long term relationship that transcends immediate issues. We don't know what the next crisis will be. All we know is that we will need to have the knowledge and the knowledgeable people to deal with it. That capability, that capacity of society to deal with problems, learn from them, and move forward, is a good part of what universities are about. The ivory tower is not isolated from society. Rather it is a place from which to take a longer view and gain a broader perspective. Graduate schools, by focusing the collective scholarly authority of the faculty, will play a central role in assuring that universities, in spite of their desire to be responsive to short-term concerns, nevertheless retain their long-term commitment to scholarship, to learning, and to society.

HUMANIZING *graduate studies in the humanities*

> In the past fifteen years, the word most frequently associated with the humanities was "plight" (Arlt, 1967, p. 301).

Thus began a paper entitled *The Renascence of the Humanities*, published in 1967 and written by Gustave O. Arlt, then the founding president of the Council of Graduate Schools and before that graduate dean and professor of German at UCLA. It is particularly appropriate to start with this quote for many reasons. For one thing, Gus Arlt provides a link between us; he was a colleague of yours and a colleague of mine. For another, the line may be timeless; it appears to be equally valid for the 15-year period preceding any particular moment.

Woven into this 1985 speech to the Modern Language Association Commission on Foreign Languages, Literatures and Linguistics is commentary from MLA leaders. Negative impressions of graduate study are framed positively, and balance between teaching and research surfaces as a theme.

In thinking and reading about the humanities, and particularly education in the humanities, I have been struck by the rich literature that exists—what Arlt refered to as "this literature of despair." Most of you will be familiar with a good deal of it. I was particularly struck, however, by part of a paper written by Louis Kampf, a professor of humanities at MIT and president of the Modern Language Association (MLA) in 1971. The title of that paper is *Toward the Dissolution of Graduate Programs in Language and Literature*, and that is exactly what Kampf proposed. In wondering about the future, he said:

> Who can be sure whether there will be a future? If civilization, such as it is, survives, I am sure its cultural and institutional life will be very different from what we know. What the function of graduate schools will be in that future world—whether they will exist at all—I do not know; nor do I much care. (p. 439)

Those lines represent some of the brighter spots in Kampf's brief paper and also reflect the pessimism felt by many academics in the early 1970s.

Why this gloom? What is it that has prompted a constant stream of agonizing appraisals and reappraisals of the state of the humanities, and particularly, graduate education in the humanities? You may be able to answer that far better than I. What I intend to do is share with you some of my impressions of what I have read and observed, and it seems particularly convenient to organize these remarks much as you have organized this conference, that is:

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recruitment and selection of students;

graduate curriculum—nature of graduate study; and

preparation for teaching.

Much of what I will say refers to humanities in general; some will be directed specifically to foreign languages, literatures, and linguistics.

Recruitment and Selection of Students

For some time the academic community has been expressing concern about the quality as well as the quantity of students entering graduate school in the humanities. It's not that bright, qualified students are not there; it's that they don't seem to be going on to graduate school, particularly in the humanities. A good deal has been said about this over the past few years, much of it focused on the conference held at Princeton a couple of years ago that dealt with *Scholarship and its Survival* (Pelikan, 1983) and on *Signs of Trouble and Erosion* compiled by the National Commission on Student Financial Assistance (1983). Since that time there have been some attempts to provide data and analysis related to this question of survival and trouble.

In the study of highest achievers done by Goldberg and Koenigsknecht in 1985 that looked at graduate student enrollment of the classes of 1956, 1966, and 1976 at a group of highly selective institutions, it is clear that the 1956–66 graduate school enrollment of high achievers in humanities was fairly stable and then dropped precipitously starting in 1966 (as it did for social sciences and natural sciences). By looking at the figures for the classes of 1976 and 1981 and at graduate student enrollment within 2 years of graduation, one sees that natural sciences and humanities have been slowly increasing (natural sciences more than humanities) while social science has continued to decline. Interestingly, the control group for humanities during this period continued to decline.

There may be many reasons for this. One certainly is the increase, particularly from about 1966, in the number of highest achievers enrolling in professional schools. That began to change in 1976 with a decline both for highest achievers and control group.

Clearly there have been changes in the decision patterns of students during the past couple of decades, and just as clearly, many bright students who could have gone on to graduate school are doing something else.

Why? Or better perhaps, why not? For some years there has been a fair amount of discussion about alternative careers for humanists. What about career alternatives for people interested in the humanities? This is a fairly wide-open field. Even if we limit it to those with undergraduate majors in humanities (and thereby factor out all of the scientists and engineers who are devoted to the humanities), we still find almost endless possibilities. Recently, law, business, finance, and the computer industry have seemed particularly attractive.

Medicine is often a good choice. In addition to providing intellectually challenging career prospects, these alternatives provide money and the promise of a life style that includes travel, theater, art, music, fine food, and wine, and today's equivalent of the Grand Tour.

Why not?

What does the academic life offer that is so attractive that the college graduate, faced with a choice, takes up the mantle of the professional humanist—the scholar and teacher? That is getting harder and harder to justify.

Recent and forthcoming studies of the faculty (e.g., *The Faculty at Risk*, Bowen & Schuster, 1985) indicate widespread and growing dissatisfaction with the profession. It's my impression that more of this dissatisfaction or disaffection, if you will, is coming from humanists and social scientists than from natural scientists. Some of the reasons for this may be the fundamental differences in motivation and concepts that direct career choices and ultimate career satisfaction in these different fields. Let me call once again on our colleague Gus Arlt (1967) to provide some guidance:

> It seems to me that the radical difference between the young humanist and the young graduate in other areas is that the latter is vocation-oriented, the former subject-oriented. The latter is drawn to a profession; he thinks of himself as a doctor, lawyer, engineer, physicist, or chemist. The former does not think of himself as a humanist. He would be surprised if you suggested it to him. He may, at best, have a vague idea that he might be a professor, but even that idea comes to him later. At some time in his undergraduate years this young person has fallen in love with literature or music or art; he has enjoyed mastering foreign languages; he has been drawn to the intricate speculations of philosophy; and he pursues these studies for the love of them, for the pleasure that they give him, and not with the thought that they may eventually provide a vocation by which he will earn a living. (p. 304)

I found this to be an intriguing notion. As an undergraduate, I became interested in chemistry. I was recruited by one of my professors who not only spent a great deal of time with me, but who got me a job in the chemical industry during the summer between my sophomore and junior years and a job in a biochemistry lab during the summer between my junior and senior years. I had never thought much about graduate school in chemistry. My major interests during that period were divided between music and literature, but I was socialized, I was proselytized, perhaps I was hypnotized. I found myself in graduate school doing chemistry and loving it. There was a clear relationship that I never thought about then but have thought about since. If you like chemistry and want to do chemistry, you can become a chemist.

But I come back to Gus Arlt's comment. If you like literature and want to make literature you become—what? A writer. If you like music and want to make music, you become a musician.

How do you become a humanist?

How, when you go about recruiting students, do you build the bridge from their liking the humanities to wanting to become humanists? I suppose that is what you are here to discuss and so I will make only one observation. In talking to dozens of very good young scholars in dozens of fields as they entered the last year of their dissertation work, I asked how they became interested in doing whatever it was they were doing—Latin grammar, or paleobotany, or statistics, or electrical engineering, and almost without exception they each identified a single faculty member usually in the first 2 years of college as being the primary cause, the igniter of latent fires, that changed their lives. How does this relate to teaching patterns in your fields? Are the scholarly interests of the faculty so remote from the undergraduate classroom that communication, particularly of excitement and passion, is impossible?

Nature of Graduate Study and the Graduate Curriculum

Here again, I find very negative comments by humanists about graduate study in the humanities. Arlt (1967) described the dilemma of the graduate student:

> Unless he is particularly fortunate in his choice of professors, he learns how to dissect poetry and prose as the scientist dissects a frog or crayfish and to dry and mount thoughts and ideas as the botanist dries and mounts specimens in his herbarium. After a year or two of this he is disillusioned and is either unhappy or resigned. (p. 305)

He went on to quote from the Woodrow Wilson Newsletter of June 1965, an essay by a graduate student of English in a major university who wrote:

> I do not know a serious graduate student who is not profoundly dissatisfied with graduate school . . . the real dissatisfaction is rooted in the academic program—I am certain that the impulse to what I would call narrow professionalism is the core of the problem. (Arlt, 1967, p. 305)

I find this echoed again and again. Barnaby Keeney, an historian, graduate dean, first chairman of the National Endowment for the Humanities, and later president of Claremont, in an article about the Ph.D. in the humanities written in 1971, commented that the entire process seems to be an intense preparation for research, which most humanists do not go on to do, with no emphasis on teaching, which most humanists do go on to do.

It is important to remember that these comments were written at a point in the cycle when there was great interest in the Doctor of Arts degree as an appropriate path for those who wanted to teach, but who were not interested

in research. As I recall, there was particular interest in this degree in some language areas. A colleague expressed the example of a number of graduate students who really wanted to teach language to undergraduates at community colleges or 4-year colleges. The only way they could get that kind of job was to get a Ph.D., and that meant doing a dissertation in literature or linguistics that they really weren't interested in. Since they had to do it, they did, but that could lead to a fairly dispirited graduate group. The D.A. would seem like the solution. But it was not very successful.

Many of the critics point to overspecialization, intellectual isolationism, and above all to a wearing down, an erosion of the spirit of too many students who leave graduate school, with or without the degree, but with a sense of loss of ideals.

This is a grim picture. How real is it? It is a picture painted primarily by you and your colleagues and you can be very convincing. Listen again to Louis Kampf (1971):

> If one must have graduate programs, what should they try to do? When I began graduate school, one of my better professors (He at least took scholarship seriously, and did not treat it as a hustle.) advised me that the purpose of the graduate program was to familiarize the student with literary history. This seemed reasonable enough until I discovered that literary history meant memorizing ... outline books, and even other people's notes. Such nonsense did not simply derive from stupidity; rather it derived from a paucity of theory. The field of English literature (or any other literature, for that matter) has no viable theory; least of all does it have a meaningful theory of its own history. Given this vacuity, how is one to construct a graduate program which is not capricious? (p. 441)

I mentioned early in this presentation that the title of Gus Arlt's (1967) paper was *The Renascence of the Humanities*. Was this simply a case of "been down so long, it seems like up to me"? No. Arlt with his characteristic optimism and humanism saw rejuvenation in the beginnings of interdisciplinary study in humane fields as expressed through comparative literature, area studies, and the study of languages, particularly the less traditional languages. As stated somewhat differently in the 1970 MLA presidential address of Maynard Mack (1971):

> We must learn to talk to those who follow other "mysteries" than our own about our subject in the normal language of men.... All over the civilized world today, the humanist disciplines are in serious trouble because they have neglected to speak either with or to the "humanity" that gives them their name. (p. 370)

All of this is a strong plea for humanization of graduate study in the humanities.

Preparation for Teaching

A constant theme in the history of graduate education and academic life in the United States is the relationship between teaching and research. This relationship is expressed in different ways by different constituencies and ranges over a continuum that comprises every possible point of view from absolute inextricability at one end to absolute incompatibility at the other.

The intensity of the discussion waxes and wanes, and right now seems to be waxing. For example, consider this from *To Reclaim a Legacy* by the Study Group on the State of Learning in the Humanities in Higher Education:

> Training good researchers is vital to the humanists and to the mission of every graduate school. But many graduate schools have become so preoccupied with training narrow research specialists that they no longer address adequately the more pressing needs of higher education for good teachers, broadly versed in their fields, inspired by the power of their subjects, and committed to making those subjects speak to the undergraduate. Unless our graduate schools reexamine this misplaced emphasis, much of our teaching will remain mediocre and our students indifferent. (Bennett, 1984, p. 19)

And also for example, this from the Project on Redefining the Meaning and Purpose of Baccalaureate Degrees:

> Central to the troubles and to the solution are the professors.... As appropriate as research is as the focus of energies and resources in the research university, the exclusive concern with research in the training of recipients of the Ph.D. degree—to the neglect of any concern with teaching or with any professional responsibility other than to scholarship—has encouraged college faculties to abandon the sense of corporate responsibility that characterized professors of the pre-professorial era. (Association of American Colleges, 1985, p. 6)

Both of these quotes appeared in widely distributed commentaries published last year. Both were written by former faculty members (humanists) at Williams College. To bring some historical perspective, consider the words of Earl McGrath, former U. S. Commissioner of Education and professor, who wrote in 1959:

> Under the spreading influence of graduate education, the liberal arts colleges shifted their emphasis from teaching to research; from instruction concerned with the key ideas of Western culture to

> instruction composed of the latest findings in ever narrower areas of scholarly investigation. (p. 14)

Or in 1969, a student was quoted as saying:

> I came to graduate school to prepare myself for teaching in the liberal arts. I have observed that teachers are second-class citizens in the academic world. I now want to do research because I have learned that that is where the prestige is. I consider this a moral decline on my part.

In all of what I have read, I find no one suggesting that the way to enhance teaching is to stop doing research or to denigrate scholarship. Rather, it seems to be a question of the tuning of a delicate system, seen by its component members (and its friends) as being somewhat out of balance and needing a push to get back. Beyond that there seems to be a need to reexamine values (a specialty of humanists) to determine not so much what went wrong, but how to define right. You have done some of that in your *Report of the Commission on the Future of the Profession* (1982), particularly in the recommendations for action. Clearly you understand the issues. Action is what is needed in terms of "reexamination of the traditional canons" as they relate to programs, students, and teaching.

Let me close by making two points. First, in reading the literature I have been describing, I find that humanists, not surprisingly, are graceful, effective, and persuasive writers who have been describing with great style and poignancy how bad things are. In some ways, reading this, particularly in concentrated form, is a little like watching a procession of flagellants—the cause may be admirable but the process makes you wince.

Second, you have many friends who are not humanists but who share your love of the humanities. They are people in all walks of life, at all levels of education, who believe the humanities are vitally important. It is essential that you find better ways to tell them about what you do and how it illuminates their lives. They support the humanities. They may not understand why it is important to support humanists.

Finally, to bring together these two points and end on an appropriate note, a last brief quote from a paper by Renaissance scholar and professor of English at Johns Hopkins, Don Cameron Allen (1971). It can serve as an end and a beginning:

> The ultimate reward of the humanistic teacher of modern literature comes when, at the end of his days, he can remember a long procession of those to whom he has given a place in the continuity of human consciousness, whose mortal loneliness he has alleviated, and to whom the past is present and the future not in despair. (p. 437)

THE GRADUATE Pipeline

A pipeline is a very graphic image. In talking about science and engineering at the graduate level I want to exploit the pipeline metaphor as much as possible, and discuss the pipeline itself as well as what is flowing through it.

In physical terms, a pipeline might conjure up this kind of image: a straight tube with parallel walls and given and fixed dimensions of length and diameter. It has a single beginning and a single end and is usually used to transport material from one point to another in an efficient and direct manner. Passage of materials through the pipeline can be relatively passive or can be affected by varying conditions—usually temperature or pressure—to speed up or slow down the process. The relative concentrations of materials at either end of the pipeline can affect rates of flow. The material emerging from the pipeline may be the same as that which entered or it may be different, depending on whether passage through the pipeline is designed to cause changes in the nature of that material. Ideally, passage through the pipeline should occur without significant loss of material, and in those cases where transformations in the material take place, conversion rates should be high. Particularly in the latter case, high quality of starting materials will usually lead to higher yields.

Reflecting popular terminology, the pipeline metaphor is used effectively in this October 1986 presentation at a symposium of the Commission on Professionals in Science and Technology.

Using this model, how do we view graduate education in science and engineering? There are several different pipelines to describe, and there are enough differences between them so that the broad term science is not particularly useful in understanding what happens. Engineering, because of greater homogeneity, can still be a useful term.

Length, Shape, and Junctions

In 1984 the median time to degree (baccalaureate through doctorate) for all fields was 10 years. In the broad science and engineering fields it was the following[1]:

Median Time to Degree

Physical Sciences	7.20 years	**Social Sciences**	9.68 years
Life Sciences	8.18 years	**Engineering**	7.99 years

It is shortest in chemistry at 6.3 years and biochemistry, 6.9 years, and is 8 years or more in mathematics and computer science. Interestingly, women seem to take

[1]Data that follow are taken from National Research Council. (1984). Summary report 1984: Doctorate recipients from United States universities. Washington, DC: National Academy Press.

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less time than men in physical science and engineering and more time in biosciences and social sciences.

There are many factors involved in determining length or duration, but one is undoubtedly financial.

> Theorem: Length of pipeline (duration of time) is directly proportional to financial pressure on the students. The greater the availability of financial support, the shorter the pipeline.

An analysis of the sources of support used by graduate students shows some striking differences, particularly in the use of the research assistantship. Men utilize this kind of support more than women, and with respect to minorities, Asians utilize it much more than blacks, Hispanics, or Native Americans. Part of the reason for this has to do with choice of field; white males and Asians dominate those fields—physical sciences and engineering—where this kind of support is most available.

Given the general range of pipeline lengths in science and engineering, it is clear that most of the new scientists and engineers with doctoral degrees who will be in the workforce in the mid 1990s are either in graduate school now or have chosen undergraduate majors that lead rather directly to specific graduate programs.

The pipeline is direct in most cases as indicated by the percentage of students with a baccalaureate in the same field as the doctorate. For most of the physical sciences and engineering this is more than 75%. Marked differences are in newer or hybrid fields like computer sciences (15.6%) and biochemistry (25.2%). In these fields the undergraduate part of the pipeline may be more funnel shaped, collecting students from a variety of majors.

The connection between the undergraduate and graduate pipelines is a leaky one, and many potential graduate students are lost at this point, some to other, often adjacent pipelines (the professions) and some to nonrelated fields or occupations. Pressure is a key factor here, particularly financial pressure, and it can be of three kinds:

1. High pressure due to immediate lack of funds.
2. Intermediate pressure due to prospective abundance of funds (visions of sugar plums). This has to do not so much with immediate financial pressure, but rather with impressions of earning potential in other fields. Examples would be chemistry majors opting for medical school or mathematics majors going into banking.
3. A combination of both, involving considerations of foregone income. This relates directly to the value of the undergraduate credential in the job market.

> Theorem: Loss of students from the pipeline at the undergraduate-graduate junction is directly proportional to financial pressure and to the economic value of the lower credential.

Actually this theorem can be extended to any pipeline junction—undergraduate-graduate, master's-doctoral, doctoral-postdoctoral—and reflects, to a great degree, the professionalization of education at all levels. As each degree becomes the appropriate credential for entering the workforce, the incentives to continue to the next degree level decrease, particularly if the salary differential between individuals with different degrees is small (A counterforce is "defensive credentialing," that is, the need to accumulate additional credentials to advance or avoid losing a position.)

Starting Materials = Entering Students

For many years the material entering the U. S. graduate pipeline in science and engineering was homogeneous. It was white, male, and American. While that is still essentially true, major changes have occurred in the percentage of women and foreign students in graduate programs in science and engineering; smaller changes have occurred with respect to American minorities.

Between 1980 and 1983 almost all of the increase in full-time enrollments in science and engineering doctoral institutions was made up of foreign students and women. The rate of growth for women exceeded men in every science and engineering major field. Essentially the same could be said for foreign students.

American minorities make up a relatively small percentage of graduate enrollments (about 10%). In terms of doctoral degrees received, all major ethnic groups except whites have shown increases in the period from 1975 to 1984.

Percent of Degrees Received by Race and Ethnicity in All Fields
(U. S. Citizens or Permanent Visa Holders)

Year	Asians	Blacks	Hispanics	Native Americans	White
1975	3.7%	3.9%	1.2%	0.1%	91.0%
1984	4.1%	4.3%	2.5%	0.3%	88.8%

With respect to choice of field, Native Americans, blacks, and Hispanics are highest in education, followed by social sciences. Asians are higher in the natural sciences and engineering.

In the *Summary Report 1984: Doctorate Recipients from United States Universities* (National Research Council, 1984), an analysis was done of the baccalaureate origins of 1984 doctorate recipients. Among other things the following points emerged:

1. For the most part, Ph.D.s in the sciences and engineering tended to get their baccalaureate degrees in major research or other doctorate institutions and to a much lesser extent in comprehensive (masters highest), liberal arts, or other institutions.

2. Particularly in engineering, physics, and astronomy, major research institutions predominated.
3. There were great differences between ethnic groups relative to source of baccalaureate degree.
   A. Asians—all the top B.A. sources in terms of output were major research universities.
   B. Blacks—none of the top B.A. sources was a major research university. All were historically black universities.
   C. Hispanics—some mix of major research and comprehensive, but all geographically distributed in the Southwest, Florida, and Puerto Rico.
4. Consideration of undergraduate sources of 1984 doctorates by ethnicity and by field of doctorate would lead one to predict that Asians would get doctoral degrees in engineering and blacks, Hispanics, and Native Americans would get doctoral degrees in education.

Theorem: The more closely the atmosphere in the undergraduate institution resembles that of a science and engineering oriented research university, the greater is the likelihood of students continuing in science and engineering graduate programs.

Quality of Starting Material

Several attempts have been made to discover whether the quality of students entering graduate school is declining. There has been a good deal of comment about "the best and the brightest" no longer going into graduate work at the doctoral level, but instead getting M.B.A.s, or degrees in the professions, particularly law and medicine.

Hauptman (1986) and Bowen and Schuster (1985) have recently summarized several of the studies, particularly those analyzing standardized test scores and those in which the career choices of the brightest undergraduates (identified in several ways—e.g., Phi Beta Kappans, Rhodes Scholars, students in the top 3.5% of their classes) are analyzed. There is some indication, particularly in studies of the latter type, that there has indeed been a shift away from graduate school and into the professions in the group of high achievers. It would be interesting to look at this in reverse, that is, to track back the academic careers of National Academy members, Nobel Laureates, and so on. My guess is that they might not follow the normal patterns.

It is interesting to note in *Science Indicators* (National Science Board, 1985) that during the period 1973 through 1983 top-rated (Lindzey-Jones[2]) doctoral programs did not decline in their production of Ph.D.s as rapidly as did lower

[2]Jones, L. V., Lindzey, G., & Coggeshall, P. E. (Eds.). (1982). An assessment of research-doctorate programs in the United States: Mathematical and physical sciences. Washington, DC: National Academy Press.

rated departments (with the exception of the social sciences). Although Ph.D. production overall is down slightly from the latter 1970s, the top-rated departments continue to get good students. But probably not as many of them.

In summary, the students entering the graduate pipeline in science and engineering are considerably more heterogeneous than they were 10 or 15 years ago, at least in terms of sex, ethnicity, nationality, and probably ability. In many fields they will be better trained and less well educated than we like to think they were in the past.

Changes that Occur in the Pipeline

Passage through the pipeline can involve change. For the purposes of this discussion we can discount changes in ethnicity and sex. Changes in nationality are a different matter. With the rapid development of so-called high tech industries taking place at the same time as an apparent waning of interest on the part of Americans in graduate work in science and engineering, the justification for admitting and training large numbers of foreign students in these areas has increasingly been that they would stay and work in this country. Thus there has been great interest in immigration policies that would foster foreign Ph.D.s' work and teaching in the U. S.

Changes in ability would be expected during passage through the graduate pipeline. There is considerable speculation that the increased emphasis on university-industry collaboration may be skewing university research more toward applied and particularly developmental kinds of projects. If this is indeed happening, and universities move away from science towards technology, the consequences could be an eroded science base and a depleted pool of scientists. Political pressure on university science and engineering graduate programs, for example, to shift emphasis away from research and towards technical development, will tend to qualitatively change the nature of the product in the pipeline.

What about leakage in the graduate pipeline? Is the pipeline corroding? Are deteriorating facilities causing loss to industry at degree levels lower than the Ph.D.? In engineering, there has always been significant interest in master's degrees. This is also true in computer science. As students leave graduate school with master's degrees in science and engineering it leaves a relatively small but fairly stable cadre who stay in the pipeline to be converted to Ph.D.s. As noted previously, this group is changing in character, most notably with respect to foreign students and particularly in engineering. Those who leave usually do not come back. If they do, it is often for the M.B.A.

All leakage from the pipeline is not irreversible. In most disciplines there are significant differences between total time to degree and registered time to degree, and this, in large part, is related to financial support. It is difficult to do good attrition studies at the doctoral level because of the long periods allowed

after admission to candidacy. Graduate students can, depending on a university's policies, disappear for several years and then suddenly reappear with chapters of dissertation in hand. All other things being equal, however, the lack of financial support, both for living and for carrying out one's doctoral research, plays a major role in influencing completion rates.

The Other End

Finally, what happens at the end of the graduate pipeline? What happens to the output? The 1984 summary report of doctorate recipients (National Research Council, 1984) presented data year by year for the period from 1970 through 1984 on commitments for employment in U. S. business and industry by broad field. It is clear that in most fields there is an increasing move in this direction.

Percent of Commitments for Employment in U. S. Business and Industry

	1970	1984
Physical Sciences	35.7%	48.3%
Engineering	57.8%	51.9%
Life Sciences	12.9%	26.2%
Social Sciences	5.0%	17.2%*
Humanities	0.6%	6.1%
Education	1.6%	6.4%
Professional Fields	6.9%	9.1%

*Clinical and counseling psychology

Most disturbing to the academic community is the concern for the future of the professoriate. Howard Bowen and Jack Schuster (1986) in their recently published book, *American Professors—A National Resource Imperiled,* have brought together a wealth of information on this topic. Their analysis of all of these data gives them reason to be disturbed about the waning interest, including that among the most talented, in academic careers. In terms of the pipeline to the professoriate, there appears to be loss at the beginning through choice of options other than graduate school, loss in the process through choice of options other than the doctorate, and loss at the end through choice of options other than an academic career. Unless ways can be found to change this, the future of science, engineering, and every other field that relies on the continued vitality of our colleges and universities is in jeopardy.

THE STRAIN *of quality*

There is an intriguing relationship between the two terms, strain and quality. Each of them has several different and distinct meanings. Strain can mean a theme, or an inherent tendency, or a great effort, or stress, or tension. Quality can mean the nature of something or the degree of excellence a thing possesses. These terms have appeared together before, in Portia's speech from *The Merchant of Venice*, when to describe the nature of mercy, she states that, "The quality of mercy is not strained." This lends itself to a subtext for this paper, which might be, "The Strain of Quality Is that There Is No Mercy."

Another 1986 speech puts quality to memorable analysis.

There is a strain that runs through all discussions of education, and particularly higher education. It is an insistent strain of concern for quality. That is, when we talk about education, we talk about wanting it to be of high quality. But we rarely define exactly what it is that we mean by high quality, and we don't often talk about what it takes to get it. To approach this topic for graduate education, we have to look at quality in both senses.

Generally speaking, the quality of graduate education—by which I mean its nature—is that it is focused (specialized), advanced, and scholarly. What follows is my sense of the meaning of these words in this particular context.

Focused —Specialized

With the possible exception of Master of Liberal Studies programs, all graduate programs are specialized, but the specialization can take different forms. Some are discipline-based (e.g., chemistry, history) some are based on a certain profession (e.g., business, nursing) some are problem, issue, or place-based (e.g., interdisciplinary programs like environmental studies or area studies).

Advanced

The basic prerequisite for graduate study is an undergraduate degree, but the relationship of that degree to a graduate program may be different for different kinds of graduate programs. Most graduate programs are based on the assumption that students are literate and have acquired knowledge in a wide variety of topics, can write a paper, and have dealt with concepts and conflicts of ideas. The acquisition of a baccalaureate degree is supposed to attest to those attributes and provide a level of education upon which to build further study. In

many of the "professional" graduate areas, particularly those leading to "tagged" master's degrees, for example, M.L.S., M.B.A., M.P.A., M.S.W., M.Ed., this kind of general education is often all that is required, since students may enter these programs with a variety of backgrounds.

On the other hand, some programs require that applicants have an undergraduate major in a specific discipline. This is characteristic of many discipline-based degrees, particularly at the Ph.D. level. (In fields like chemistry and physics approximately 80% of doctoral recipients have undergraduate degrees in the same field.)

Finally, some graduate programs are based on the premise of an undergraduate education in a professional school. This is characteristic of fields like engineering, performing arts, and to some extent, education. The assumption is that the student has a set of specific skills and basic knowledge of the profession.

Scholarly

This defines the context in which all graduate programs operate. It is based on the premise of an evolving generalizable knowledge base whose components are public knowledge, representing a consensus of peers. Depending on level, the student must be able to understand and use that knowledge base (master's), and make significant contributions to it (doctoral). Synthesis and analysis involving all components of a program are essential and usually evaluated through some kind of general or comprehensive examination or the production of a thesis or dissertation. There must be a strong sense of a program whose components are designed to act synergistically and produce a product that is more than the sum of its parts.

These are general characteristics of all graduate programs. A more specific categorization is based on whether the program is research or practice oriented. There are obvious overlaps but generally speaking, research oriented programs are driven by the state of knowledge in a discipline; practice-oriented programs are driven by the state of practice in a profession.

These definitions provide a way of understanding the nature, or the quality of graduate education:

- A Ph.D. program in physics should be advanced, focused, scholarly, and deal with the state of knowledge in physics.
- An M.B.A. program should be advanced, focused, scholarly, and deal with the state of practice of business.

These are the qualities of graduate programs. Now I want to examine how they have developed.

Prior to World War II universities were involved in educating relatively small numbers of students. In 1911 about 40,000 degrees were awarded in the United

States, approximately 25,000 baccalaureate degrees, 14,750 master's degrees, and 497 doctorates. World War II had a dramatic effect. Total degree production had risen steadily until 1940 at which point it declined, to recover in 1947–48 and increase to new and higher levels. In 1947 there was a 42% increase in master's and professional degrees followed by a 48% increase in 1948. By 1949 the rate of increase year by year in degree production at all levels had begun its return to pre-war levels but the numbers of students did not decline. This increase dropped off during the middle 1950s, but in 1959, 98,901 master's and professional degrees were awarded. The number rose fairly steadily through the 1960s and 1970s, by which time approximately 300,000 degrees were being awarded annually. By the late 1990s, that number had risen to approximately 400,000.

Much the same thing applies to doctoral and baccalaureate degrees except that doctoral production did not decline during the 1950s, but for the most part continued to rise at a fairly steady rate, with a plateau from the mid 1970s to mid 1980s, to its present annual level of approximately 45,000.

The changes in volume after World War II, spurred by the G. I. Bill, made it clear that a much larger segment of the population believed that attending colleges and universities was not only financially possible, but also relevant to their career aspirations. This was particularly true at the graduate level in the sciences and engineering and in the production of faculty members for a rapidly expanding higher education establishment. Many more people expected to go to college. Society in general began to view colleges and universities as the appropriate place for young people 18 to 23 years old to go in order to prepare for a career, and for graduate degrees, particularly at the masters level, to be closely related to advancement in a career.

Graduate education has always been vocational. People who wanted to spend their lives working in a particular field went to graduate school to add specialized and advanced training to general education. The problem that began to emerge was that general education started to become more specialized to prepare people for continued specialization.

The point is that after World War II, many more people viewed colleges and universities as being part of their career training. This had two effects:

Vocationalism increased at all levels of the curriculum; and

Access to graduate education was increasingly seen as being important in economic terms, particularly with respect to professional careers.

Certainly other changes have occurred in the years since World War II, but this change in society's perception of the role of the university has had, I believe, a dominant effect on the current state of higher education and, most particularly, postbaccalaureate education at public universities.

Why public? Because institutions supported by public dollars are expected to be responsive to public perceptions of need, and especially at the state level proximity has a way of intensifying the political expression of that need. Why postbaccalaureate? Because in an age of rampant professionalism and mass postsecondary education, certification at some level past the baccalaureate becomes increasingly important in differentiating the workforce.

Robert Hutchins, president of the University of Chicago, expressed the response of higher education to the increasing interest in educational credentials somewhat cynically in 1936, when he observed that:

> Every group in the community that is well enough organized to have an audible voice wants the university to spare it the necessity of training its own recruits. They want to get from the university a product as nearly finished as possible, which can make as large and as inexpensive a contribution as possible from the moment of graduation. (p. 36)

I mentioned earlier that U. S. universities currently award close to 400,000 master's degrees. Those degrees will carry between 800 and 1,000 different designations. There will be several large groups. In the professional areas, the M.B.A. and M.Ed. dominate, followed by other well defined degrees like the M.S.W., the M.P.A., the M.F.A., and the various engineering degrees. There will be many M.A. and M.S. degrees, each usually followed, at least implicitly, by words like "in Chemistry," "in English," or some other discipline. And there will be hundreds of other degrees, with a bewildering variety of letters (one of them always being M), some awarded in only one institution, that express the response to perceived and usually local need. In many cases this is not really a question of public policy or even educational policy. It is a simple market response.

There is little question that people who work have use for specialized as well as general information, knowledge, and skills. The real question is how to get it. This specialized knowledge could be learned on the job through experience, and indeed, often is. To the extent that any of it can be generalized, it could be learned through home study, from books describing techniques, case studies, and any of the new technologies serving as platforms for providing continuing education. Some of this is also done. Courses could be given, by proprietary groups, by professional associations, by colleges and universities through continuing education programs, and by for-profit educational institutions, and much of this is also done. All of these work, and work well if the employee is motivated and if the outcome expected and desired by the employee and the employer is improved work performance. But in so many cases, that is not enough. There needs to be some kind of official certification. This is illustrated most vividly in the movie version of the L. Frank Baum classic *The Wizard of Oz*.

You may remember that the character of the scarecrow continually demonstrated the ability to think his way through complex problems, but he wasn't happy because he believed he didn't have a brain. After persevering through a series of harrowing experiences, he asked, as his reward, for a brain. Here is where the book and the movie part company. In the book, the wizard fills the scarecrow's head with bran, so that he would have "bran-new brains," and with "needles and pins, to make him sharp." In other words, what the wizard gave the scarecrow was something to improve and refresh his mind and make it even better than before. But in the movie, the wizard, ever the patent medicine salesman and the purveyor of panaceas, gave the scarecrow a diploma, which, although not providing the scarecrow with any new abilities, convincingly demonstrated to everyone that the wizard was responsive (and a pragmatist) and the scarecrow was smart (and a realist).

Like the wizard, we seem to be operating the "Great American Degree Machine." If you want to advance in your job and become an administrator—get a graduate degree in administration. If your field is making more use of computers—get a graduate degree in computer science. If you are changing fields, get a graduate degree in whatever sounds like the field you are changing to. The educational system, in all of its diversity, seems always ready to respond. But the desire to be responsive often results in departure from high standards for performance, and that not only will be a disservice to universities, the students, and the public, but also will eventually trivialize the entire educational enterprise.

Quality in graduate education requires a commitment to substance over form, to depth over breadth, and to intellectual development over technical proficiency. There can be considerable strain in maintaining these balances, particularly in the face of public pressure to train for minimal acceptable performance rather than to educate for maximal intellectual potential. The problem is that developing, maintaining, and nurturing quality in educational programs imposes a strain on all parts of the educational community. That strain can be financial when funds are allocated (or reallocated) on the basis of considerations of quality. It can be political when programs are continued or discontinued on the basis of considerations of quality. It can be personal when faculty or students are not permitted to start or continue what they want to do because they are not qualified. In all cases it will be emotional.

In addition to the strain imposed by making decisions based on quality considerations within the university, there are strains in the relationships between universities and state higher education offices when the same kinds of considerations are used to make decisions about new program approvals and allocations of funds at the state level. And of course, both partners, the universities and the higher education offices, will feel the strain of responding to public demands for certification at inflated degree levels. Hutchins was being realistic in 1936 when he described the pressure placed on universities to do job

training. Exacerbating the problem is our inability to clearly define educational quality, particularly in quantitative terms. In the search for proxies we often descend to totally inappropriate measures like the ability to turn out the largest number of students in the shortest period of time and at the lowest cost. But this kind of procurement-based approach is no more valid in describing educational quality than it is in describing quality of any kind. It comes closest to describing efficiency, but education is not an efficient process.

Edward Deming, the statistician who influenced the development of Japanese industry after the Second World War, has said that if you want to increase productivity, increase quality. In a multi-step process. Improving the quality of the starting materials will improve productivity. You can carry a smaller inventory because there will not be as many rejects, and you will not have to repeat operations because of faulty materials. This is a powerful metaphor for education, which must be viewed as a lifelong, multi-step process in which the quality of each step can be defined by how well it prepares you for the next step, particularly when you don't know what the next step is going to be.

I believe that universities need to examine carefully and thoughtfully the nature of their responsiveness to public perceptions of educational need. When we develop new graduate programs they should have some definable, generalizable knowledge base that will give students the capability to learn and to improve. We should not develop graduate programs in techniques or skills but rather in areas with sufficient intellectual content so that graduates can adjust to constantly changing techniques and skills. Finally, graduate programs must have a solid base in scholarship. They must be directed by a faculty whose active involvement in their fields keeps them from becoming professionally isolated and academically provincial.

Doing this is not easy. More than that, it does not always seem to be what students, their parents, their employers, or the general public want. There are too many strains involved in quality. Those who have it must strain to keep it. Those who don't, have to strain to get it. At the very least, it means that everyone has to work harder. It may be altogether too uncomfortable, too demanding of time, money, intellect, and emotion, particularly if people feel that, in an immediate and practical sense, it really does not make much difference. In that case we can say that what we do is of high quality and then rely on its being too much trouble for someone else to prove that it isn't.

But universities really cannot take that course. The strains of quality—the strain of deciding what it is we are about, what we should and should not be doing, and most particularly, the strain of insisting on the highest standards of performance for our students and ourselves, will not stretch the university out of shape. Indeed, those strains are uniquely associated with the academic values and processes we cherish. Our acceptance of academic mediocrity, however, will cause such distorting strains that neither we nor the society we serve will be able to tolerate them.

PREPARING FACULTY: graduate education's role[1]

Since the vast majority of faculty members have doctoral degrees, and since the places in our society that grant doctoral degrees are universities with graduate schools, almost everyone who is a faculty member has successfully completed graduate school. Obviously, the converse is not true. That is, all those who successfully complete graduate school are not faculty members.

This exposition of the role of the graduate school in the preparation of future faculty first appeared in the May/June 1987 AAHE Bulletin.

Bowen and Schuster (1986) in summarizing the studies on career aspirations of college students, commented on the small number of students who show interest in becoming college teachers and the distressing fact that, small as they have been, these numbers are getting even smaller. On the other hand, the number of students going to graduate school or planning to go to graduate school to pursue doctoral degrees has remained fairly constant over the past 10 to 20 years (although there have been no significant changes in the makeup of that student group). Thus the decision to go to graduate school does not imply a decision to become a faculty member. Graduate school is not a normal school for faculty. It may be a part of the process, but there is more to graduate school than just preparing people to be faculty members, and there certainly is more to the preparation of faculty than just going to graduate school.

I intend to use a lens with a slightly wider angle and focus on the relationship of graduate school to what comes before and after it, using the frame of preparation of faculty.

The Undergraduate Period

Recruiting for graduate school is, for the most part, discipline based, although it may also be problem or issue based. The point is that most undergraduates decide to go on because of field-related, rather than specific job-related, interests. The names we have for what they choose are names like chemist, economist,

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psychologist, electrical engineer, and so on, and not names like college professor, project manager, personnel director, or consultant. They relate more to intellectual involvement and skills than to the places people work or the specific things they do. Further, none of the names we use connotes the college classroom. In fact, it is only where we have no names to describe our intellectual involvement—for example, in languages and literature—that the connotation of faculty is compelling. Our recruiting is done by appealing to the research or scholarly aspects. We do not recruit future faculty members by talking about physics or literature or anthropology or genetics. Faculty members who have been raised in the culture of their disciplines proselytize actively among good students. When possible, opportunities are provided for bright undergraduates to participate in research. The entire emphasis of undergraduate education is on capturing a budding interest in a field and directing its growth toward a career in that field.

Graduate School

Graduate education, at least at the doctoral level, is devoted almost totally to providing individuals with advanced education and training so that they can work in their chosen fields. It is almost always discipline based, although occasionally it gets more specific than that, and there is a strong element of socialization in the discipline. In addition, there is another level of socialization—to the life of the university. In most cases, the relationship to the discipline, to the "invisible college," is inherent. The relationship to the university is incidental. Chemistry students learn to look like, act like, think like, and talk like chemists. They work with other chemistry students, their teachers are chemists, they meet other chemists at regional and national meetings. In short, they become chemists. They also, however, observe, and are influenced by, the academic climate in which they are immersed for 5 or 10 years. Many of them will be teaching assistants, and all will work with faculty in more colleague-like relationships than they had in the past. Some will become actively involved in university governance and serve on academic committees and councils. They may become interested in what chemists do on university faculties.

A certain number of these people will decide to explore the possibility of a faculty career. This proportion will vary greatly by discipline as will the timing of the decision. The fewer the options, the earlier the choice. Put another way, the more numerous the options, the more likely it is that the choice of any single option will be a conscious decision and not a foregone conclusion. Those with an interest in 18th century English literature will know early on that they want to be college professors. Those with an interest in organic chemistry might not make that kind of decision until after graduate school.

In any case, the institutions responsible for the graduate education of most faculty members have viewed the graduate experience to be directed toward the production of good research and good researchers. Efforts to train people to become college teachers are few and are directed primarily toward teaching

assistants. These activities usually are discipline based, and are extremely variable in adequacy, intensity, and quality across departments and institutions. The TA experience, in the right context, with the right mentor or mentors can be a superb introduction to college teaching; in the wrong hands, it can have the opposite effect. But even the TA experience is not often viewed as a specific mechanism for training prospective college teachers. It can be seen solely as a way of supporting graduate students that gives them good experience. That can be an end in itself.

In addition, there is great difference between those fields where TA support is the only support available and where those students fortunate enough to get appointments try to hang on to them for years, teaching the same introductory courses over and over again, and those fields where it is more usual for students to be TAs for a year or two and then move into a research assistantship or fellowship. In the latter case, one could assume that a message was being sent—that is, you teach until your grant is funded and then you don't have to do it any more. I wonder if the former situation, which can lead to teacher burnout before a graduate student finishes degree requirements, might not be worse. At any rate, I believe that broad-brush indictments of the TA experience are unfair and unproductive. They do a disservice to hundreds of departments in dozens of disciplines that spend time, effort, thought, and money on TA training and education.

After all that, it remains true that Ph.D. education in this country, at least in the arts and sciences, is based on the concept of turning out scholars capable of doing independent work and not on the idea of training college teachers.

The Postgraduate Period

The National Research Council's Survey of Earned Doctorates collects data on the postgraduation plans of new doctorate recipients. The summary report (National Research Council, 1983) of the surveys indicated the following about the immediate postgraduate plans of the doctoral cohorts from those 1969 and 1983:

1. In 1969 almost 70% of those with definite plans were going into academic employment. In 1983 that number had dropped to 48%.
2. Differences by field were large:

Field	Percent in 1969	Percent in 1983
Humanities	93	80
Social Sciences	69	45
Biological Sciences	41	18
Chemistry	18.5	8

3. The major reasons for this decline are complex and vary by field. Across all fields, the major changes were not, as one might expect, in greatly increased numbers going into business and industry, although there were some

increases in the postdoctoral category. Even in the humanities, where the number of people seeking postdoctoral positions is miniscule, the percent of those with immediate postdoctoral plans doubled (from 1.9% to 3.7%). In chemistry it rose from 33% to 43%, in engineering from 5.3% to 13%, in social sciences from 8% to 14%, and in biosciences from 43% to 66.6%. The only other rise as dramatic was in increase in humanities graduates going into business and industry of .4% to 6%.

An increasing number of Ph.D.s are taking postdoctoral appointments. There are many reasons for this that I will not go into here except to make these observations:

> Postdoctoral experience in research is sought after, often funded by the federal government or other extra-university funding entities, and adds a valued credential to the curriculum vitae of those seeking either academic or other employment. In many fields, it has become a prerequisite for an academic job. It provides an opportunity to hone one's research skills, not as a student, but as a colleague.
>
> The equivalent postdoctoral experience in teaching, producing what Bowen and Schuster (1986) referred to as "the nomads" (full-time, nontenure track faculty on short term appointments), is characterized by "despair and dogged determination rather than optimism" (p. 151). It is rarely, if ever, funded by outside sources and may be viewed negatively by prospective academic employers.

Thus, in the period immediately after completion of graduate school, a period very appropriate for applying one's formal education and training to some specific career objectives, we persist in the idea that training in research is the appropriate preparation for a career as a faculty member. Apparently we reject the idea that training in teaching, at the postdoctoral level, is useful or desirable.

Preparing the Professoriate

In all fairness, we must consider the diversity of the system we are examining, particularly with regard to type of institution and discipline, and recognize that for some disciplines, particularly the sciences, and for some institutions, particularly the so-called major research universities, the system works very well. The bright, well-prepared, and motivated student will find an atmosphere of intellectual excitement and stimulation in the research university that is unmatched in any other place in our society. Jeremy Bernstein's articles in the *New Yorker* (1987) on how he became a physicist make excellent reading on this topic. Among other things, Bernstein illustrated the role of the scholar-teacher.

But preparing faculty members for that small number of selective, research oriented universities is not really the major problem. The problem, as stated recently by Boyer (1987) in *College*, is that "the American professoriate is a

profession with many cultures" (p. 128), and the diversity of the institutions from which they come and in which they will teach and pursue their scholarly interests is enormous. This makes it highly unlikely that a single way of training faculty (in the generic sense) will ever be productive.

In 1949 Howard Mumford Jones, in an address titled *The Graduate School and the Problem of Training Teachers* suggested that we split graduate education in two, with research training institutes for producing research workers and graduate colleges, "the primary purpose of which shall be the education of persons competent to teach intelligently the general work of the liberal college" (p. 61). Jones described the attributes deemed desirable in a university professor. The idea of personal scholarship was implicit. Added to it were broad ranging interests that extended beyond one's field to the entire range of human knowledge. All of this was coupled with training in the theory of learning and the art of teaching.

There is little question that this particular combination is highly desirable. The problem is producing it. Most of the specific programs suggested over the years have not been successful. The Doctor of Arts degree still has some advocates, but it has never become the widely accepted college teaching credential hoped for by its originators. The Ph.D. program, through the recruitment of academically able students with scholarly interests and with its concentration on comprehensive knowledge of a field and original research, continues to be a way to prepare faculty members and, perhaps surprisingly, it often works very well, producing that unique combination of teaching and research that characterizes the best in American higher education.

In all of the discussions of the role of research and scholarship in the preparation of the professoriate, I have found total agreement on one point. Faculty should be scholarly. In Boyer's (1987) words:

> While not all professors are or should be publishing researchers, they, nonetheless, should be first-class scholars. We understand this to mean staying abreast of the profession, knowing the literature in one's field, and skillfully communicating such information to students. To weaken faculty commitment to scholarship, as we define it here, is to undermine the undergraduate experience, regardless of the academic setting....
>
> Scholarship is not an esoteric appendage; it is at the heart of what the profession is all about. All faculty, throughout their careers, should, themselves, remain students. As scholars, they must continue to learn and be seriously and continuously engaged in the expanding intellectual world. This is essential to the vitality and vigor of the undergraduate college. (p. 131)

The best way we have found to produce scholarly people is through immersion in scholarship and the scholarly process. But we have spent little time or effort in

thinking about the uses to which scholarship is put. We have assumed that research is the logical and desired outcome of scholarly training, and rarely have we considered the idea that scholarship is the process we use to bring together the results of research so that we understand the current state of knowledge and can speculate intelligently about the future (!!!!) Viewed in that light, teaching, as the act of refining and transmitting the knowledge acquired through research and scholarship, becomes a direct and desirable outcome of scholarly training.

The desire to do basic research is not the only reason to become a faculty member; indeed, I believe it is realistic to suggest that teaching at the college or university level is a reasonable aspiration for people interested in pursuing scholarly careers and that the scholarly preparation for that kind of career is done quite well in our graduate schools. But as I pointed out earlier, there is more to the preparation of faculty than just going to graduate school. The pre-graduate period of induction into the discipline of scholarship has to be seen in broader terms than just as an introduction to research. The matter of recruiting young potential scholars (or faculty members) is based on the relationship between student and teacher, and while this is seen as putting the student on the right track, that track can be so narrow, particularly through the construction of a kind of pre-graduate major, that the talented undergraduate can lose the valuable experience of general learning that characterizes undergraduate education. Instead the student may seek to become a clone of the teacher, and if the teacher's interests are narrow, the student will emulate that model.

Coordination across disciplines is needed to bring these interested students into contact with each other. Honors programs can facilitate this, but what is really needed is for undergraduate students who are working their way into fascination with a discipline to have the opportunity through seminars and related experiences to share that excitement with other students, and thus, in effect, begin to teach. Recruitment of these students should involve explicit mention of teaching. The involvement of bright juniors and seniors as tutors for beginning undergraduate students or even for high school students should be encouraged.

The teaching assistant experience in graduate school forms another part of the process and must be taken seriously as part of the development of faculty members. There are many examples of excellent programs that have been developed for this purpose, and efforts are underway to create a national clearinghouse for information on these programs. The relationship of the graduate school to the colleges in the matter of TA training is often a delicate one. TAs are part of the undergraduate teaching force, and department chairs as well as college deans may feel that graduate deans have no business interfering in what is basically an undergraduate instructional issue. But if the issue is defined in terms of the preparation of future faculty members, it becomes the business of all those to whom the continuing quality and vitality of the faculty is important.

We have developed a system that relies heavily, at least in those universities that are responsible for training Ph.D.s, on graduate students as teachers of undergraduates. We have no hesitation about citing the important roles of mentors in the preparation of scholars, and the argument is just as valid in the preparation of teachers. Graduate schools, working with departments and serving a coordinating role within institutions and among institutions, can lead the way in the development of effective programs for training TAs as college teachers.

Finally, the postdoctoral teaching experience, viewed as a logical continuation of the pre-graduate and graduate experiences, and recognizing the increasing scholarly maturity of the prospective faculty member, can serve as a capstone in the process of preparing college professors. As pointed out previously, the teaching equivalent of the research postdoctoral appointment, that is, a short term—2 to 3 years—full-time, intensive, nontenure track involvement in one's field, has not been a particularly fruitful idea. Although there have been specific programs to do this over the years at a number of universities, no generally accepted model has evolved. Yet here again, the mentor idea should be compelling and new Ph.D.s should be interested in the opportunity to spend several years developing their teaching skills under the guidance of established faculty members in colleges and universities that have made specific commitments to undergraduate education. This kind of experience should be a definite asset to those seeking academic positions, and the current revival of interest in the preparation of faculty makes it a good time to design and implement programs of this kind.

Throughout this article, I have referred repeatedly to the graduate school. That is a term that means different things to different people. In its most general sense, the graduate school is the faculty and students studying together in specific programs at the postbaccalaureate level. In its most specific sense, it is a central university office responsible for nurturing and fostering graduate education in all programs across at least the arts and sciences and often across the entire institution.

I also have described a process designed to bring young scholars into the faculty ranks. However defined, the graduate school sits in the middle of this process. It is vitally concerned with the quality of the undergraduates it recruits, and it depends for that quality on the effectiveness of the undergraduate faculty, all of whom are either still in graduate school or products of it.

The scholarly nexus at which interested students become faculty members is the graduate schools. To view graduate schools only as teacher training institutions, however, would be a mistake. To view them as being responsible for bringing together the discrete parts of the process for preparing scholarly faculty is a challenge that they are uniquely capable of accepting.

GREAT EXPECTATIONS: *the role of the American university in the 21st century*[4]

A centennial celebration has a sense of arrested motion about it, like a moment suspended in time. There is a feeling of being poised on some kind of brink, of catching our breath while we balance on the edge before being pushed into an uncertain future by the weight of 100 years of history. It is appropriate, and certainly traditional, to look back at the institutions we have built, the problems we have solved, and even the mistakes we have made, and to take comfort in the belief that we have gained something from the experience. If we are smart, we may have learned to do things better; if we are very skillful and very lucky, we may have learned to do better things. With that in mind, and because the hundred year period we are looking back at today coincides almost exactly with the history of graduate education in this country, I intend to talk primarily about graduate education.

Given as the New Mexico State University Centennial Lecture in March 1988, this speech presents an overview of the history of graduate education. The use of balance and education's role in society appears again.

Although there were many attempts to establish graduate education in the United States in the mid 1800s, none was successful until Johns Hopkins University was created in 1876. It was the beginning of a new era in higher education, and like every beginning was characterized by enthusiasm and high hopes. Beyond that there was a feeling that forms the central theme of my remarks—a feeling of great expectations. This was expressed most clearly in the inaugural speech of Daniel Coit Gilman, first president of Hopkins, who declared that the founding of the university would mean "less misery among the poor, less ignorance in the schools, less bigotry in the temple, less suffering in the hospital, less fraud in business, less folly in politics" (Gilman, 1969, p. 13). That is a marvelous vision, comprehensive in its scope and compelling in its intensity. But it raises a set of questions that were being asked then, and are still being asked today. What do we expect from universities? What are universities for? Do we really expect universities to do all of these things, and if so, how? Clearly Gilman expected that the establishment of a university based on research and scholarship would have a direct effect on people's lives. This was a new and different role for the university, but one that placed it squarely in its time.

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The first great articulator of the university's purpose in modern times was John Henry Cardinal Newman, whose ideas, reflecting the Oxford and the England of the 19th century, centered on the life of the mind, on "raising the intellectual tone of society [and] cultivating the public mind" (Kerr, 1964, p. 3). Newman favored liberal knowledge and said that useful knowledge was a "deal of trash" (Kerr, 1964, p. 2). The times, however, were changing, and changing rapidly. Even as Newman wrote these words at mid century, Jonathan Turner, a Yale graduate schooled in Latin and Greek who had taught for a while at Illinois College, was promoting the idea of "a state university for the industrial classes." In an excess of evangelistic zeal, Turner proclaimed that such a university would have an effect on society equivalent to any earlier religious reformation:

> [I]f every farmer's and mechanic's son in this State could now visit such an institution but for a single day in the year, it would do him more good in arousing and directing the dormant energies of mind than all the cost incurred, and far more good than many a six months of professed study of things he will never need and never want to know. (Carriel, 1961, pp. 77–78)

In 1853 Turner convinced the Illinois legislature to petition Congress for grants of federal lands to establish an industrial university in each state. At almost exactly the same time Justin S. Morrill, a Vermont storekeeper, had been elected to Congress, and in 1857 he wrote a bill incorporating Turner's idea. Although President Buchanan vetoed the bill in 1859, Morrill persisted, and in 1862 Abraham Lincoln signed the Morrill Act establishing the land-grant universities.

Meanwhile in Germany, the scientific and industrial revolutions had created a new kind of university with a faculty heavily involved in research, and much of that research was being transformed rapidly into advances in a burgeoning technology-based industry. But the German university did more than bring science into the academy. It did so in an era of nationalism and industrialization that provided a direct linkage between the products of the university—knowledge and highly skilled people—and the productivity of the nation. America, in the period following the Civil War was experiencing the same kinds of growth and development; but Americans who wanted to participate directly in shaping the future of their country, particularly in the areas of science and technology, had to go to Germany to obtain advanced degrees.

This confluence of events paved the way for the beginnings of graduate education in this country. American educators finally began to realize that universities could do more than just prepare a small elite for lives as public citizens and scholars. They could be seen as instruments of national purpose. It was no accident that Gilman's vision for Johns Hopkins was conceived in terms of the betterment of society through the intellectual accomplishments of scholars. But the establishment of this new kind of institution did not settle the question of the use of universities. It compounded it.

The American graduate school, in its beginnings, was still basically an elitist institution, strongly based in the German tradition that legitimized research and the involvement of faculty and student in research, particularly in the sciences. Research universities were those that considered the graduate school of arts and sciences to be at the heart of the enterprise along with certain professional schools (law, medicine) and research institutes. But this was changing even as it was being described. The land-grant movement, the antithesis of elitism, was proving irresistible, and universities were expanding their vision of their role to include applied research as well as service, particularly in terms of technical assistance to the public. At the same time, they were becoming accessible to a wider range of the population than ever before.

This was a new idea—that universities were to serve the many rather than the few, and that universities and their faculties and students were to be involved directly in dealing with societal problems. On this point Clark Kerr (1964) wrote, "German intellectualism and American populism were merged in the new university. Pure intellect and raw pragmatism made an unlikely but successful alliance" (p. 48).

What happened next was inevitable in an era of rapid scientific and technological advances coupled with a vigorous economy. Everyone had great expectations, and increasingly, universities were seen as integral to the fulfillment of those expectations. New kinds of programs appeared in universities—in agriculture, engineering, business, education, and a host of others. And this was not just in the land-grant universities. Yale established a school of forestry, Harvard a business school, and Princeton a school of engineering. Before long, a counter-revolution came into being. Abraham Flexner (1967), a strong advocate of the modern graduate school, was complaining by 1930 that universities were becoming "secondary schools, vocational schools, teacher-training schools, research centres, 'uplift' agencies, businesses—these and other things simultaneously" (p. 167). He suggested that Harvard disown the school of business and let it become the "Boston School of Business." Universities, he said, had become "'service' stations for the general public" (Flexner, 1967, p. 52).

Many joined him in this view, and no voice was more eloquent than that of Robert Maynard Hutchins, the young president of the University of Chicago. Writing in 1936 about higher learning in America, he stated:

> There is a conflict between one aim of the university, the pursuit of truth for its own sake, and another which it professes too, the preparation of men and women for their life work. This is not a conflict between education and research. It is a conflict between two kinds of education." (p. 33)

In a scathing paragraph, Hutchins (1936) expressed his view of vocationalism in the university:

> If you set out to prepare a boy for a trade there are and can be no limits to the triviality to which you will descend except those imposed by the limitations of time at your disposal. You can justify almost anything on the ground that it may be helpful to a young man in his profession. And if you take the view that a university may properly prepare boys for trades, there is no limit to the number of trades you can train them for except those imposed by the limitations on your resources. Since you can usually make a school pay if you make it vocational enough there are really no limits at all. Any occupation that wishes to be dignified will say that it is a profession and suggest that the university cooperate by offering a curriculum preparing young people for it. This is a free country, which in my business means that anybody is free to make suggestions to a university and demand that they be carried out. (pp. 39–40)

Hutchins (1936) was not opposed to people learning how to work. His vision of the university life was closer to Newman's and centered primarily on the intellectual life and devotion to scholarly activities:

> The justification for the privileges of universities is not to be found in their capacity to take the sons of the rich and render them harmless to society or to take the sons of the poor and teach them how to make money. It is to be found in the enduring value of having constantly before our eyes institutions that represent an abiding faith in the highest powers of mankind. (p. 58)

But the die was cast. American universities were a new phenomenon, totally characteristic of the country and the time. We had created the multiversity, that conglomeration of graduate, undergraduate, and professional schools combined with every imaginable kind of institute, center, clinic, and program, and offering education, training, entertainment, health care, and a plethora of other services. Gilman's vision was realized in a way he never would have expected—universities were touching every part of American life.

The other major influence on higher education was the Second World War. Until then, the system I have been describing, and particularly graduate education, was relatively small, and the research establishment in universities was almost totally limited to single investigator, low cost, basic research. With the exception of agriculture, there was almost no continuing federal involvement with higher education prior to World War II. Everything changed in the 1940s. Scientists in universities were called upon to help in the war effort by directing their research toward militarily important goals. Whether it was the atomic bomb or anti-malarial drugs, the academic research establishment met the challenge and formed a new alliance with the federal government. This, coupled with the G. I. Bill after the war ended, made a major change in universities. A massive amount of federal funds, for support of students and for support of research, became available. Established

universities grew, and new universities were established to meet the demand for university education and training at all levels.

The land-grant movement had created the concept. The post-World War II relationship with the federal government provided the means, not only for unprecedented numbers of students to attend the university, but for research in the university to grow into a huge enterprise, quite unlike anything ever seen in a university before. And university research became almost totally dependent on federal funds for its existence.

What has this meant for graduate education? This part of the system that played such an important role in shaping the modern American university continues to be a dominant force in any consideration of the role and responsibilities of higher education today. It has grown, in terms of the number and kind of degrees it offers, and the number of people it serves, into something quite different from that envisioned by its founders, who saw it mainly in terms of doctoral study and basic research. Much of the research done in our graduate schools today is very applied and there are pressures to make it even more so. Much of the graduate study being carried out is at the masters level, and most of that is in nonthesis programs directed toward preparing people for professional careers. This is all consistent with the idea of the university responding to the needs and expectations of society, but graduate educators continue to raise the same questions they have been raising for 100 years: Is this what we should be doing? How far do we go in being responsive? What should we expect of graduate education? The answers are far from clear. What has become apparent, however, is that these questions become more difficult to answer as the relationship of universities with society becomes more complex.

During the past 25 years we have witnessed a number of changes—social, economic, political, scientific, intellectual—that have been particularly challenging to our ideas about the role of universities. The constituency has broadened to include minorities, women, an entire new wave of immigrants, foreign students in unprecedented numbers, and older, returning students who need to re-tool for changing jobs. Our ability to manipulate information, either numerical or genetic, has affected the way we teach, learn, do science, and think about the world. At the same time state governments have been pressing universities to be more directly involved in economic development, industries have been seeking new alliances with universities to invigorate a flagging industrial capacity for creativity, and the federal government has been urging universities to do more defense-related research.

In the atmosphere of these changes, graduate education finds itself in a period much like the one that existed prior to its beginnings in this country. Bernard Berelson (1960), in his study of graduate education in the United States, described it this way:

> The forces pushing [graduate education] towards its establishment finally succeeded—the needs of the times, the pressures of science upon the classical curriculum, the patriotic competition with the German system,

> the dissatisfaction with the current character of collegiate instruction, the inherent attractions of advanced study. (p. 9)

Berelson further stated that this period settled the issue of whether we were to have graduate education or not. It also settled, for the most part, the question of how we were to do it. I should like to explore these questions—whether and how—with respect to a number of the challenges facing graduate education today. I believe it is important to do so because the way we answer them will define graduate education in the next century.

Historically, graduate education in the United States has been dominated by white males. There are entire groups of Americans like minorities and women who have been excluded and who are now seeking greater access to graduate education. No rational person could seriously question whether this is a good idea. It is something we must do. Our concern is—how? Clearly it is not universities' problem alone, but just as clearly, graduate educators cannot take the position of waiting until society has changed so that everyone can follow the same pathways that white males have established. We need to do something now.

In trying to find ways to increase the presence of minorities, women, and other historically underrepresented groups at the graduate level, universities have tried a number of different approaches. Some of these approaches have worked, some have not. Some have worked in some places and not in others. Some have worked at one time, but not later. No one has found a single simple answer to the question of how we do this that applies for all time and all places. We have gradually come to learn that programs focusing only on financial aid or special recruitment, without any concern for cultural differences or the creation of a supportive atmosphere usually do not work for very long. A chronic fault of these kinds of programs is that they tend to isolate the students from the mainstream of the institution. This has been more the case for minorities than it has been for women, largely as a function of numbers. More than half of the graduate students in American universities today are women, and the processes that universities use to carry out their regular functions cannot treat this large a population as a special case. For the most part, this has not been true for members of minority groups, many of whom find themselves at institutions that have difficulty dealing with them in any way other than as special cases. This "specialness" leads not only to the perpetuation of stereotypes, but to students' insulation from the intellectual life of the institution and in many cases to withdrawal from a university that is seen as being irrelevant to their lives. They may have been admitted, but the university, for them, has been inaccessible. Particularly during this past year, universities, shaken by incidents of racial antagonism and alienation, have begun to redefine their commitment. We are still learning how.

The situation with foreign students is quite different. Here there is no question about how. The number of foreign graduate students has been increasing dramatically. In many ways, American graduate schools, particularly in the sciences

and engineering, bear the same relationship to the countries of the developing world as German universities did to the United States 100 years ago. For the most part, students from these countries are a highly selected group of individuals who do very well academically in our programs and who seek out these programs because of their undisputed excellence. The question that has been raised by many educators and particularly by the political supporters of public universities is whether it is a good idea academically, politically, or economically for our engineering and science programs to be so heavily populated with foreign students. Indeed, it has not been unusual for engineering programs, particularly at the undergraduate level, to restrict foreign student enrollment to a very small percentage of the total class. For the most part, this has not been true at the graduate level, but there are still concerns about the possible effect that large numbers of foreign students have on the nature of technical education in our schools and a nagging worry about providing advantages to our economic competitors. The question of whether is far from settled.

Quite the opposite is true in terms of the role of graduate education in the career plans of students. In the minds of employees and employers alike the master's degree has become the degree associated with professional advancement. Thousands of people with baccalaureate degrees come back to the university to obtain the appropriate training and credentials needed to advance in their careers. Universities have been enormously responsive to this demand for advanced degrees, and today we grant close to 300,000 master's degrees each year in some 800 different specialties, the vast majority of which are related to professional practice. The question of whether appears to have been settled. The question of how remains before us.

Currently, most students enrolled in masters programs attend school on a part-time basis. For the majority of them attending class between nine and five Monday through Friday is difficult if not impossible due to family or work obligations. At first, and usually in urban areas, universities dealt with this problem by providing classes in the evening and on weekends, but as the demand increased, in terms of numbers of students who both wanted and needed these degrees, universities began to develop ways to come to the student, rather than the other way around. Today, graduate courses leading to the master's degree are offered in every imaginable setting, from commuter trains on the Long Island Rail Road to high school buildings in small towns hundreds of miles from the university, from industrial plants and military bases to elaborate off-campus centers established by universities expressly for the purpose of providing classroom instruction. In addition, interactive television and computer networks have changed the way we define off campus, since students at remote sites can be participating in a course taking place on the campus.

We know how to deliver a course to a student in a variety of ways; we are not so sure how that relates to our ideas about graduate education. We like to think

that graduate education involves a certain level of intellectual involvement of students and faculty that goes beyond the time spent in class, and we are concerned about how difficult that can be in an off-campus setting. Actually, that can be difficult in an on-campus setting, and the enormous expansion in part-time study at the masters level is causing the graduate community to try to better define its expectations about this level of education however it may be offered. We are not sure we know how to do this, and it is important that we find out.

In considering the relationship between universities and their patrons—the states, private industry, and the federal government—the interaction between the questions of whether and how becomes more complex. Let me cite some examples. There is a long and productive history of universities working with industry and government. No one seriously questions whether this will continue, but there is a good deal of uncertainty about how it will. Dorothy Nelkin (1984), after reviewing some of the events of the past few years involving proprietary rights, freedom of information, national security regulations and others, concluded that in the relationship between science and society "scientific autonomy and freedom of inquiry, once taken for granted as undisputed rights, are more accurately viewed as products of negotiated agreement and exchange" (p. 90). She states further that "scientific knowledge has become, in effect, a commodity, vulnerable to commercial interests, public demands, and military controls" (p. 91).

The key issue here appears to be secrecy—as it relates to national security, as it relates to international economic competitiveness, as it relates to industrial or government sponsorship of research, and finally as it relates to the health of scholarship and graduate education. This is hardly a new issue. But as long as science was fairly well defined as being different from technology, as long as basic research and its applications were separable activities, universities, except in time of war, were not greatly affected by publication restrictions or other related limitations on the dissemination of information. Universities took strong positions on academic science as a public resource. There was general agreement among scientists, potential sponsors, and the public that it was appropriate for universities to concentrate on basic research since this was a good way to train researchers, and since the theories, hypotheses, and findings of academic scientists formed a useful resource for all. The genius of the industrial sector was seen as its ability to develop products utilizing the research available from its own laboratories and from universities whose two most valuable products, as far as industry was concerned, were people and theory.

As universities increasingly seek research support from sponsors whose goals are related to showing a profit for stockholders, both the nature of the work and the restrictions on dissemination change. Further, as state governments increasingly see universities and particularly university research laboratories as integral to economic development in the states, additional pressures for applied research and development may be brought to bear that change the essential nature of the institution.

In this connection I was interested to see a recent article in *The Chronicle of Higher Education* that described the major concern among Japanese government officials and researchers that creativity in their universities had been stifled by concentrating too much on applied research and development. As a point in fact, Susumu Tonegawa, a Nobel laureate on the faculty at MIT, has been widely quoted as saying that if he had stayed in Japan he "couldn't possibly have won the [1987] Nobel Prize in Medicine" (Brooks, 1988, p. A49). To change this climate, the Japanese government has begun spending more money on basic research, giving more grants to young researchers, and increasing the number of foreign exchanges and joint projects with other countries. They are also working on changing regulations so that universities and businesses can share resources more easily in the pursuit of pure science.

On a related topic, a long essay in *The Washington Post* entitled "The Agri-Biz Bonanza" (Sinclair, 1988) raised serious questions about the kind of research now being carried out in our agriculture schools in the land-grant universities. The point of the article was that many people feel that the university-based agricultural research establishment that has done so much for food production and for farmers in this country is devoting its research attention more toward projects that will improve profits in the agricultural industry than those that will improve life for the farmer or the consumer of food.

In each of these cases, we are dealing with the perception of the role of research in the university, particularly with reference to how that role intersects with the role of research in industry. There is a growing concern that when the two begin to be indistinguishable, everyone is a loser.

The relationship with the federal government is somewhat different. As I pointed out earlier, World War II began a new phase in universities in this country, primarily because of the development of an incredible dependence on the federal government for support of university research. It appears at first glance that the question of whether simply does not arise. But again, we have to look at the relationship between how and whether. For example, there was no question during the 1960s and early '70s that a great deal of university-based research would be supported by federal grants and contracts, and universities knew how to handle that. However, when the implementation of some of this research turned out to be on classified projects, many university scientists simply refused to work on them. Indeed, during this period of time, most major research universities in the United States, after prolonged discussions by their faculties and students, formulated policies that prohibited themselves from accepting classified research contracts. It is important to understand that for the most part the arguments involved here did not deal with whether research should or should not be classified. The issue had to do with research in the university and with whether, in that setting, the acceptance of classified research was appropriate. Most universities decided it was not. The

reason for that decision has to do with the generally held belief of the academic research community that the results of research must be public.

A similar kind of argument has been going on for the last 2 years over the strategic defense initiative, the so-called Star Wars Project. Hundreds of American scientists and graduate students have signed petitions refusing to work on these projects as a matter of principle. Again, it is not really a question of whether or not this work should be carried out that is at stake (although on purely technical and cost benefit grounds that issue is not at all clear). The point is that individuals are deciding on their participation as a matter of personal belief in what they, as scientists, and what universities, as institutions devoted to humanistic goals, should do.

We have come full circle. The question of what the American university is, and what it is to become, still captures our interest, and although the specific issues have changed somewhat, the context remains much as it was a hundred years ago. Berelson (1960) suggested several themes characteristic of those times that have, as he put it, "an impressive historical vitality." These are:

> the normal resistance to innovation and change by established faculties;
>
> the tension between scholarship and professional practice as the primary objectives of graduate study;
>
> the impact of a fast but unevenly growing body of knowledge; and
>
> the conflict between influences on educational policy from inside the academic community (the universities and the disciplines) and from outside ("the needs of the times"). (p. 8)

As we try to understand the debates now taking place on our campuses, debates ranging in topic from the nature of the undergraduate reading list to the participation of universities in joint ventures with industry, it is clear that these themes still dominate the discussion and it is likely that they will continue to do so. That is not surprising. Universities exist in a fine balance between being responsive to "the needs of the time" and being responsible for preserving some vision of learning that transcends time. It is this balance that characterizes the modern American university. Maintaining it requires the constant search for values that define the role of a university in a society whose survival is increasingly dependent on the ability of its people to make knowledgeable and wise choices.

Society continues to have great expectations—expectations that universities can solve all their problems and answer all their questions. But universities have not been so much concerned with answering questions as with understanding what the real questions are. They have not been so much concerned with solving problems as they have been with understanding how problems can be solved. This is a difficult and demanding role, but it is one we must preserve if we are to ensure that people who learn in universities have a broader vision of their world, a brighter view of its prospects, and even greater expectations of their own ability to make a difference.

COMMUNITIES OF SCHOLARS: *research in the university*

Among the most difficult, controversial, and interesting issues confronting graduate education today are those related to research and its effects on universities. To discuss research in the university it is necessary to take two complex subjects—research and universities—and combine them to form a new entity, with its own integrity, that must be considered on its own terms. Research in the university is different from research outside of the university, and the fact that universities engage in research affects their basic nature.

This discussion of contemporary university research issues was given in October 1989 at Texas Christian University.

Four topics are illustrative of the issues that arise from doing research in universities. They are all of current interest, and all are the subject of considerable conflict within the academic community and between that community and others involved in higher education. In large part, how we resolve these conflicts will determine the future shape of universities.

Research, Teaching, and the Preparation of Faculty

Research in the university affects the quality of teaching, the nature of the curriculum, and the preparation of the faculty. The question in each case is how, and that question has been raised repeatedly by individuals inside and outside of universities since the beginning of graduate education in America.

Perhaps the best place to start is with the preparation of the faculty. Basically, there is a single model for preparing faculty members: graduate education at the Ph.D. level. The problem is that it is not really a process for preparing faculty members, but rather a process for preparing individuals to do independent research in a field. About half of the people who earn the degree (and this varies widely by field) end up taking academic jobs in an incredibly diverse group of universities and colleges with all kinds of missions and goals, and the only thing they can be sure of is that they will have to teach. Most faculty members will spend most of their time teaching, and some will spend all of their time teaching. They usually come to these jobs with good training in their disciplines, a certified ability to do original research (at least once), socialization to a value system that rewards productivity in research above all else, and little or no training to be teachers.

A number of suggestions have been made over the years to develop different, more directed kinds of programs for training faculty members. Perhaps the best

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known of them is the Doctor of Arts degree, which is still offered in a number of universities. None of these alternatives has been really successful. The Ph.D. model remains dominant and carries with it a set of values that affects universities.

Faculty members trained in this system are involved in several different kinds of professional communities. They are members of the "invisible college" of their discipline, composed of colleagues around the world who know them by their research. They are members of a department, also composed of disciplinary peers in the same invisible college but who, in addition, are fellow teachers and advisors of students. Finally, they are members of university faculties, made up of colleagues from a wide variety of disciplines, all involved in carrying out some university goal related to education and perhaps, research. It is the interaction of the value systems of these communities, particularly with respect to the relationship of teaching and research, that concerns us here.

Daniel Alpert (1985), writing about the organization of American research universities has described what he calls a matrix model. In this model, the columns represent the disciplines, and the rows, universities. Going across the rows, one sees the relationship of the disciplines in a given university, while going down the columns, one sees the relationship of departments in the same discipline in many universities. In examining the functions carried out by faculty, Alpert suggested that "[b]y and large, the horizontal (campus) community addresses itself to the undergraduate teaching mission of the university, whereas the vertical (disciplinary) community addresses itself primarily to graduate education, research, and faculty selection and performance" (p. 251).

The values of the disciplinary community are quite clear. They, that is, disciplinary peers, define the current state of knowledge in a discipline and evaluate the contributions made to the formation of that consensus by each member. Honor and prestige are reserved for those whose work is judged to be significant, provocative, and elegant; disdain awaits those whose work is trivial or pedestrian. The invisible college exerts tremendous influence over the lives of its members through the peer review system. Evaluation of grant proposals, articles submitted to journals, books, promotion or tenure applications, all involve the peers' opinions about the quality of one another's scholarship. Those opinions play a major role in determining advancement in an academic career.

At the department level, many of the same values apply. Particularly in research universities, the reputation of a department is determined almost entirely by the same process used to determine the reputation of an individual. The various rating systems usually end up evaluating the opinions of disciplinary peers about the scholarly work of the faculty. These opinions are turned into numbers that are then arranged in rank order and used widely in the public and education press in describing quality. This is very important to departments, not only in terms of their own self-esteem, but also in terms of their place in the

budget process of their universities. High rankings in reputational surveys, many publications in refereed journals, many grants from sponsors using the peer review process—all of these strengthen the department chairperson's hand in arguing for resources.

There is another factor, however, that appears at the department level, and this has to do with a department's instructional activities. There is little question that with few exceptions, the quality of graduate programs is closely connected to the quality of the faculty as determined by the system I have just described. Graduate students seek out programs for a number of reasons, but the best students choose places where certain kinds of work are going on and where they can be in contact with other students and faculty members actually doing that work. Thus, departments with strong graduate programs tend to adopt the values of the invisible college and, in general, this serves the best interests of graduate students and faculty alike.

But faculty commitment to the graduate program can have direct and major effects on the undergraduate program. For some, intense involvement with research has as its direct corollary disinterest in and perhaps disdain for undergraduate teaching. Universities, through their reward structures, can exacerbate this problem. Often the reward for research excellence is a reduction in teaching load, sometimes to the vanishing point. Paradoxically, the reward for teaching excellence is usually also a reduction in teaching load, often to provide more time for research. In either case the message is clear: teaching can be avoided by concentration on research. This can lead not just to deterioration in the quality of teaching but to a decline in the quality of research as well, particularly if the desire to avoid teaching is the primary motive for doing research.

Preoccupation with research can also affect the nature of the curriculum. Some believe that the model of graduate education that produces the faculty—research oriented, specialized—leads them, in turn, to modify the undergraduate curriculum so that it becomes a kind of pre-graduate vocational program. Particularly in those arts and sciences disciplines where the number of undergraduate majors is small, there may be little interest among the faculty in the undergraduate courses they teach on a service basis. It is easy, under these circumstances, to use the graduate curriculum as the model for design of undergraduate courses and to lose contact with the idea of general education at the baccalaureate level. It is here that the role as university faculty member becomes important.

University faculties, acting as a community, are once again beginning to assume responsibility for university education. There is a resurgence of interest in the character and quality of the undergraduate curriculum, ranging from concerns about excessive vocationalism to arguments about what undergraduates should be reading. The major challenge is to use the incredibly rich intellectual resource that is the faculty to invigorate the education of undergraduates.

Funding Research

It is romantic and in some cases, realistic to describe people who do research as searchers for truth, or beauty, or knowledge. However, much of the history of research, particularly research in science, concerns another kind of search—the search for patrons. From the days when alchemists sought royal patronage so they could buy the alembics and retorts they needed to study the transmutation of elements to the present, when some scientists have to buy supercolliders and supercomputers to do essentially the same thing, the need to find patrons has been a compelling force.

The central issues in the patronage of research are quite clear. Who pays? That is, are there different kinds of patrons whose interests and capacities direct their support to certain kinds or levels of research? What process is used to distribute a limited resource—in this case, money—and what does the patron expect to get from the arrangement?

It is worthwhile to pursue the historical precedents a bit further. In times gone by there were three kinds of patrons of research:

> kings or emperors—what today we would call the federal government;
>
> dukes and other nobles (more regional figures)—what today we would call state government; and
>
> wealthy private citizens—what today we would call the private sector or industry.

There are three major reasons for any of these patrons to support research:

- Wonder, by which I mean interest in or fascination with some project or field of study because of its intrinsic attributes. Today we would call this basic research in the sciences or creative work in the arts and humanities;
- Worry, by which I mean concern about the need to solve some specific problem because not to do so exacts a certain social or economic price. Today this is called applied or targeted research; and
- War, by which I mean war—what today we would call military research.

In the olden days, any one of the three kinds of patrons might support research for any one of the three kinds of reasons, but the system works somewhat differently today. State government and private industry support applied research and development primarily because of worry—worry about economic development for the states and economic survival for industry. They don't support military research at all and rarely support basic research.

That leaves the federal government to deal with wonder, and also worry, and war, and creates a dilemma. How do we divide the pot between these three, and once we have done that, how do we distribute the resources in each pot? The

answer to the first question is fairly clear. We invent politics and use the political process to divide the total pot. So much for wonder, so much for worry, and so much—and maybe some more—for war.

It is when we get to the next question, distributing the money in each pot, that the research community begins to play a role beyond that of supplicant. We invented a system of competitive grant programs in which researchers act as judges of the merits of each other's research proposals. We call that system peer review. At least we used to call it peer review, but the term peer seems to have taken on elitist overtones, so at the urging of the National Science Foundation and others, we are substituting the word "merit," which presumably connotes equality. Actually it is a better idea to shift the emphasis from who is doing the reviewing to what is being reviewed.

At any rate, peer or merit review gave us a way to have recognized experts in a given field evaluate research proposals on the basis of a number of factors, paramount among which are the research ideas themselves, the methods proposed to explore these ideas, the ability of the proposers to carry out the work, and the relationship of the project proposed to the program being funded. It is a unique system, one that is based on the assumption that scholars can review each other's proposals in an unbiased and ethical fashion, and that quality can be discerned and defended in the community of researchers knowledgeable in a particular field.

It seems as if it should be an incredibly fragile system, subject to all the frailties to which flesh is heir, and although some perceive it as an old-boy network, numerous studies indicate that it works and works quite well.

During the past few years, however two factors have begun to affect this delicate system. First, university facilities for research, that is laboratories, and other special purpose facilities, have been deteriorating, and no merit based, competitive research facilities programs have been operated by the federal government since the mid 1960s. Attempts to develop these programs have not met with enthusiastic support either in Washington or on campuses, largely because the usual process was to propose funding them by reallocation from research grant program budgets. This was particularly distasteful to faculty members who, while realizing that their ability to compete for grants was being threatened by inadequate facilities, were most concerned about their ability to maintain funding of their programs. The situation created strain and frustration among faculty, between faculty and administrators, and between universities and agencies of the federal government. Clearly something had to be done.

What was done, however, came as a surprise to many in the research community. Individual colleges and universities began to seek direct congressional appropriations for facilities, primarily through the intervention of lobbying firms retained for that purpose. These appropriations were not related to any authorized program, and the institutions receiving them had not applied to or been evaluated through any kind of competitive process based on merit.

This is the second factor: the earmarking or pork barrel issue, which has historical precedents in the political process described earlier.

When I talked about the states as patrons of research, I referred only to their local role, that is, their support of research at the state level. But in addition to those elected officials who stay home and operate local programs, there is another group of elected officials who leave the states and go to Washington. These members of Congress remain responsive to their constituents even as they make decisions affecting national goals and priorities, and their responsiveness provides an opportunity for local or individual concerns to lay claim to federal funds. There is nothing new in this except that earmarking used in the past primarily for government buildings, highways, and similar projects, is now being used for research facilities.

The issue of earmarking for research facilities has divided both the academic and the congressional establishments. There are those who claim that since we are not talking about research, but rather about buildings, there is no point to merit-based technical review. This is an argument that has always escaped me. Clearly, a rational decision to fund a research facility should involve evaluation of the ability of those who propose to do and manage the research. But others have said that if you have the facility, you can attract the appropriate people, and furthermore, that this would help solve perceived inequities in the geographic distribution of federal funds for the support of research.

Some in Congress assert that earmarking for research facilities is a congressional prerogative not requiring the approval of academic scientists. That is undoubtedly true. Some scientists and academic administrators believe that, in the absence of facilities programs, there is no other way to get the facilities they desperately need to be able to develop their research programs and to compete for funds, faculty, and graduate students. Others feel that the answer to that problem is a new federally funded, merit based competitive facilities program with recognition of different types of institutions to ensure a broader base of support. Over and above the facilities issue, the success of the earmarking approach to facilities has inevitably led to the use of the same process for research grants and contracts.

It is truly a hot potato, and holding any position firmly is apt to get you burned. Nevertheless, the earmarking process, carried to its extreme, will lead to a kind of anarchy that is antithetical to the basic principles of research. The research community (to the extent that there is such a thing) will have to decide whether it is advantageous to collectively influence federal agencies to develop programs for major facilities funding based on review of scientific merit, or to act individually, with each member pursuing its own goals in a kind of Darwinian approach to a constantly evolving environment.

University-Industry Relationships

I do not propose even to attempt to discuss all of the issues, or even most of them, that are involved in the recent reconceptualization of the research relationship

between universities and industry. Instead, I want to make a few general observations.

There is nothing new about universities and industry working together in research, and historically, there have been three ways in which that interaction has taken place: philanthropy, consulting, and contracts. There is no need to dwell on them. They are all familiar, and in fields like engineering, the health sciences, and many of the physical, biological, and social sciences, they have provided a way for industrial funds to support a wide variety of activities generally seen as being of mutual benefit to both parties. All of these mechanisms are used today, and they all work reasonably well. Both parties, universities and research-based industries, understand how to do this on the basis of long experience, particularly in fields like science or engineering.

Several years ago, however, a new phase began. Particularly as a consequence of extremely rapid developments in two fields—molecular biology and microelectronics—alarms were raised about the apparent lack of connection between the latest developments in basic research (primarily in university laboratories) and the use of that research by industry in the development of products. The alarm was intensified by recognition of the rapid advances being made in these fields by other countries, particularly Japan. Phrases like "high tech" and "economic development" were used to describe new opportunities and new challenges and today we hear the term "competitiveness" as a slogan to rally around in the brave new world of a global economy. The university, as the source of both research and researchers, has come to be viewed as a major participant, along with industry and often state or federal governments, in a newly defined American economic revitalization.

This is not just a matter of doing more of the same kinds of things we have done in the past. There are also qualitative differences. I will mention two. Some companies have negotiated extremely large multi-year contracts with universities on the basis of shared, long term interest and expertise in a broad area of research. This programmatic approach is much different from the usual specific project-oriented research contract and provides an exciting and productive way for these two different kinds of organizations to work together. Obviously, this is not for everyone, but in those cases where the proper match-up exists, and where the industry involved can take a long view, this has the potential to work well.

The other kind of relationship is quite different. It usually involves a group of faculty in a specific area of research and a group of investors for an incipient company joining in business ventures designed to make and sell products. The recent history of biotechnology is rife with examples. This type of relationship has been the subject of many conferences and studies.

It is this second kind of relationship that raises one of the most difficult issues for the university research community. That issue is secrecy.

Secrecy in research is not a new phenomenon. Research related to national security has always had restrictions placed on its dissemination, and those

organizations and individuals that have chosen to work on research in militarily sensitive areas have had to accept classification as a condition of their work. Many universities, as a result of thoughtful debate about the nature of research in universities have developed policies that prohibit the acceptance of classified research contracts. It is important to understand that, for the most part, the arguments involved did not deal with whether research should or should not be classified; the issue had to do with research in the university, and with whether, in that setting, the acceptance of classified research was appropriate. Most universities decided it was not. The reason for that decision has to do with the generally held belief in the academic research community that the results of research must be public.

John Ziman in his book *Public Knowledge*, argued this case persuasively. He contended that the state of knowledge in any field at any time represented "a consensus of rational opinion" of those competent to judge. Thus, research results must be published in the open literature, discussed in open meetings, argued about by graduate students and faculty, and used to illuminate teaching. As Ziman (1968) put it, "In other words, scientific research is a social activity. Technology, Art and Religion are perhaps possible for Robinson Crusoe, but Law and Science are not" (p. 10).

Knowledge, to be useful, must be public. That implies the existence of some evolving body of knowledge, developed through consensus, and available to all. For most of us, that would translate into some concept of basic research, that is, research that advances the state of knowledge; and that is a kind of research uniquely associated with universities. The role of universities in the utilization or application of that knowledge, particularly if it leads to articles or concepts of military or commercial importance, raises different kinds of questions.

Dorothy Nelkin (1984), after reviewing some of the events of the past few years involving proprietary rights, freedom of information, national security regulations, and others, concluded that in the relationship between science and society "scientific autonomy and freedom of inquiry, once taken for granted as undisputed rights, are more accurately viewed as products of negotiated agreement and exchange. . . . [S]cientific knowledge has become, in effect, a commodity, vulnerable to commercial interests, public demands, and military controls" (pp. 90-91).

For the most part, the conflicts arise over the topic of secrecy and involve several specific kinds of issues:

- Perhaps most basic, the idea of secrecy in research is the antithesis of the widespread belief in a research community that freely shares information;
- The proprietary concerns of industrial sponsors, particularly as they relate to patents and trade secrets, become more important as the relationship between university and industry changes. This is clearly the case where the direct involvement of faculty in commercial ventures gives rise to conflicts

between the responsibility as a scientist to share information, and the responsibility as a participant in a business to restrict it; and

- Universities are places for learning, and when restrictions are placed on the dissemination of knowledge, learning is compromised. Nelkin (1984) commented that "secrecy in research precludes replication and weakens the system of peer review" (p. 25).

"Conflict of interest" and "conflict of commitment" are becoming phrases that faculty, perhaps more than any other group, must try to understand and explain. To a great extent, the future of research in the university depends on how we deal with this vexing problem.

Ethics and Integrity in Research

Up to this point I have talked about how research affects the way universities interact with students, with faculty, with patrons, and with the scholarly community. Implicit in that discussion is the concept that research itself is governed by ethical norms, adhered to by all its practitioners, that assure the integrity of the system. The research community must assume that published information reflects what actually was done, that data are accurately represented, and that those whose names appear on papers actually contributed to the research described. Unfortunately, this assumption is not always correct. Individuals have plagiarized the work of others, have falsified data, and have altered the results of experiments. The fact that they were discovered is an indication that the system of public knowledge and review by peers, does provide a mechanism for exposing fraudulent and unethical behavior. But whenever incidents of this kind occur, it not only chills the research community but brings into question the integrity of the entire enterprise—in this case, research in the university.

Scientists in universities usually work with colleagues—faculty members, postdocs, and graduate students—and it is common practice to jointly author papers. What can happen was described recently by a colleague who had to investigate a case of research fraud. The culprit, a senior scientist, resigned after being challenged to produce his raw data and refusing to do so. The problem for the university was some 60 coauthors involved in dozens of questionable papers, all of whom were being asked if they really were responsible for the papers that bore their names. Graduate students particularly are in an extremely difficult position in cases like this. They may find it awkward to refuse to lend their names to papers to which they feel they did not contribute and even more awkward to question the propriety of such a suggestion or to act as whistleblowers when they suspect scientific fraud.

It is not difficult to understand that scientists and scholars, like other people, are not perfect, and that some will engage in unethical or sociopathic behavior to advance their own goals. The challenge has been to the communities in which they exist to try to find ways to deal with this problem.

Basically, there are two approaches, regardless of whether we are talking about research, baseball, the Congress, or any professional group. One is before the fact, and involves development of rules, codes of ethics, and standards of good practice. The community decides on appropriate standards, makes them public, and tries to ensure that new members understand and accept them. Until recently, most universities assumed that the principles of good research, and the ethical framework assuring integrity in research, were well understood by faculty and students and did not have to be articulated. The events of the past few years have changed that assumption, so that most universities now either have or are developing statements of principles governing the conduct of research.

The second is after the fact and consists of the development of procedures for investigating allegations of fraud, misconduct, or unethical or unprofessional conduct. This is the part that gets most of the attention in the public press and is the most difficult because, in addition to the legal and quasi-legal issues involved, at the heart of the process is the idea that a community that believes in its right to define its own standards must assume responsibility for dealing with its own problems. This is always devastating for all concerned, because while the development of standards and codes of ethics brings the members of a community together to express their ideals, investigations of misconduct bring them together to face their failures.

Conclusion

For each of the four topics I have discussed, there are conflicts over the very basic values connected with research in universities. A major question, in each case, has to do with what happens when individual (or institutional) self-interest conflicts with the shared values of a community. There are several possible answers to that question. One is that the community pulls together and ousts those who deviate from accepted practice. This is clearly what is happening in cases of research misconduct, primarily because there is no argument about the basic issue, either in the disciplinary community or in the university community. No one believes that misconduct is good. But it is not so clear in the other examples, where considerable differences of opinion exist about the relationship of research and universities. In these cases several other options are available.

One option is that the community engages in debate about the issues that divide it, with the expectation of several possible outcomes, some of which are that:

the majority view will prevail and the minority will change its behavior;

the minority view will prevail and the majority will change its behavior;

compromises will be reached; or

neither will change its views, and the community will split into separate groups.

In terms of research in the university, the debate is still underway with respect to earmarking of federal funds for the support of research and conflicts of

interest and comment resulting from university-industry relationships. So far, no one has been drummed out of the corps.

But it is the relationship of teaching and research that is most difficult. Robert Rosenzweig (1982), in his book *The Research Universities and Their Patrons*, wrote that "a research university is one whose mores and practices make it clear that enlarging and disseminating knowledge are equally important activities and that each is done better when both are done in the same place by the same people" (p. 1). Among the important messages in that statement are that universities are primarily involved with knowledge (in contrast, for example, to information), that teaching and research are equally important, and that they are connected and affect each other synergistically. These all rest on the assumption that the kind of research done in universities is uniquely related to the teaching functions of the institution, and that the universities' mission to transmit knowledge flourishes in an atmosphere of scholarly inquiry. There is a desperate desire in the academic community to believe that this is true, and in some cases, it is. But the scope and complexity of modern research, coupled with the potential for generating or spending huge sums of money, may be skewing the relationship from teaching and research to one better described by the phrase, teaching or research.

As pointed out previously, there has been a long-standing concern that preoccupation with research can divert faculty from their roles as teachers of undergraduates, not just in terms of contact hours, but in terms of time spent adapting the results and processes of research to the needs of undergraduate instruction. It has always been assumed, however, that the research interests of the faculty were directly and closely related to their graduate programs. Astonishingly, there are indications that this may be changing and that some of the research being done in universities has become increasingly irrelevant to the education of graduate students, even those pursuing the Ph.D. degree. In some fields, faculty members have begun to work with postdocs and technicians rather than with graduate students because these professionals do not have to worry about classes and examinations and because it is easier to control information that is proprietary or might become proprietary if it is outside of the free and open exchange of ideas that characterizes graduate education. In addition, the demands of managing and acquiring support for certain kinds of large-scale research operations often conflict with the mentor role associated with advisers of doctoral candidates. We may have reached a stage in the development of the research university where some research activities have become so dissociated from the educational mission of the institution that they are better done in other places by other people.

Research, as it increases and illuminates our understanding, is a proper, indeed a necessary, activity in a university. The problem arises when research fails to inform the learning of our students. This is the issue with which all of those communities involved with universities must grapple.

SOME THOUGHTS

on the relationship between research and research universities

The American research university is a unique creation. It was conceived in the belief that the research and teaching activities of the faculty were synergistic, and that its principal products were knowledge and knowledgeable people. There are many signs that this vision has changed. We appear to be at a point today where there is widespread discontent with the nature and quality of undergraduate instruction, the graduate education process leading to the Ph.D., the preparation of faculty (and, indeed, teachers at all levels), and the prospects for graduate students, postdoctoral associates, and future faculty to obtain the funding necessary to carry out the research they have been trained to do and upon which their careers and the technological and economic future of this country depend.

This presentation to the President's Council of Advisors on Science and Technology in July 1992 reiterates the Council of Graduate Schools' commitment to the vitality of research universities.

Much of this has been described in a number of papers and reports that raise questions about the state and future of the academic research enterprise. Let me cite a few specific examples.

In the discussion paper, *Science and Technology in the Academic Enterprise: Status, Trends, and Issues*, the Government-University-Industry Research Roundtable (GUIRR, 1989) working group stated that, "While graduate education in the U. S. continues to include significant research components, what appears to have changed [in the 1980s] is the extent to which expanding academic research programs include instructional components" (p. 1–9). The report also concluded that the factors leading to expansion of the academic research enterprise combine "to provide disincentives to teaching" (p. 1–9). Over the years we have grown accustomed to the observation that the research activities of the faculty may lead them to be uninterested in teaching undergraduates. We have been shocked by recent observations that the same thing may apply to teaching graduate students.

The recent report from the Office of Technology Assessment (1991), *Federally-Funded Research*, told us rather bluntly that there will never be enough money to fund all the good ideas and suggested that we reexamine the "Sorcerer's Apprentice" model for producing new Ph.D.s that we seem to be using in doctoral education.

National Research Council (1991) data on doctorate recipients documented a decline in new Ph.D.s going into academe, and even for those who do, a decline in the number who cite teaching as a primary activity.

Bowen and Rudenstine (1992), in their book *In Pursuit of the Ph.D.*, pointed out the long time to degree and poor completion rates in many doctoral programs in a limited set of highly selective, very prestigious universities. They, and others, also cited major concerns about the nature of doctoral programs, with particular reference to the relationship between students and their advisers.

Most of these publications allude, in one way or another, to the pursuit of research dollars that has preoccupied many universities, particularly since the beginning of the 1980s, and the effect this has had on individual universities as well as the entire academic research enterprise. No one has suggested that universities give up their research activities. Instead, what is called for is a recognition that the educational responsibilities of universities make research in universities different from research outside of universities, and that the reasons for supporting it have to extend beyond the simple procurement of research results to include the development of people and ideas.

The question is balance—balance between the research and teaching activities of a university. Much of this is related to institutional values. The federal government is deeply involved in the life of research intensive universities and will continue to be so, and it has been too easy for universities to shape their values to fit sponsor imperatives.

I have mentioned a number of concerns about the state of our universities. Even with these disturbing observations, most of us remain convinced that the American research universities are an intellectual resource unparalleled in the world. And we are right. The problem is we are not quite sure how best to use them.

Recent developments, particularly those having to do with economic development and considerations of international competitiveness, seem to be moving some of these institutions to look and act more like industrial or national research laboratories.

For example, many universities have established, and others are actively seeking to develop, in the words of the GUIRR report (1989), "extra-departmental research centers and institutes and hiring non-teaching researchers to operate them" (p. 1–9). Land-grant universities have operated experiment stations in agriculture and engineering for many years, and the development of various kinds of research centers and institutes in universities is

not a new phenomenon. For the most part, these have been related in some way to the educational mission of the institution and have been valuable adjuncts to departmentally-based programs. I have a sense, however, that the kinds of centers alluded to in the 1989 GUIRR report may have little, if anything, to do with the ongoing programs of the universities that house them. Units of this kind may provide an effective way to pursue research, but the questions remain:

> Why in a university?
>
> How do these activities relate to the educational mission of universities?
>
> Is the research better because of some interaction with students?
>
> Is the teaching improved because of the presence of the research activity?

It is clear that universities can be involved in research activities unrelated to the teaching of undergraduate and graduate students, but should they be? Is this the best use of our research universities?

It seems to me that there are two approaches we should consider in thinking about the future of research universities. One has to do with the institutions themselves, and the other with the entire academic research enterprise. At the institutional level, the ideas that make the most sense to me are expressed in the recent publication *America's Academic Future* (National Science Foundation, 1992), the report of a colloquium of Presidential Young Investigators. It is an unusual report in many ways. Reports with titles like that usually come from groups of very eminent, very distinguished elder statesmen and women of the academic establishment. This one came from young faculty members who in the words of a participant are "mostly from research universities, probably a majority of them non-tenured, with a strong interest in teaching. This is a somewhat lonely group in the sense that most return to environments where many of their colleagues subordinate their teaching to research interests, and all are tempted to do so" (p. back cover). They also are among our brightest hopes for helping us find out what to do with our universities.

Their report is not long. It covers a variety of topics dealing with learning in universities, with renewal and innovation in curriculum, with scientific literacy, with access to careers in science, engineering, and mathematics for all segments of society, and with the development of faculty. It is filled with specific recommendations to universities, funding agencies, and legislators.

Coupled with this is the report *Fateful Choices* from the GUIRR (1992) working group. Among other things, that report suggested several scenarios for the future of academic research that involve trying to understand the structure and size of the research enterprise in this country, or even just the academic research enterprise, as if it were a system made up of different but

complementary parts, all acting in some integrated fashion, but each with its own unique role to play. We have never been able to do that well, but I think we have to keep trying.

I believe that research universities and the federal government need to work together to redefine the academic research enterprise. We need to view the support of students, faculty, and institutions as parts of a matrix whose cross-cutting components are teaching and research, and all of which is set in the context of national goals. That means, among other things, that the support of education, training, and institutional research facilities has to be in concert with the support of research rather than a threat to the research careers of academic scientists. While this sounds like a formidable task, in many ways we are close to it. If we limit ourselves to the sciences and engineering, we have seen in the last few years much greater attention being given by research universities and the federal government to K-12 and undergraduate education in these subjects, the participation of women and minorities, the preparation of faculty, scientific literacy, integrity and ethics, and other related issues.

Implicit in these approaches is a unique role for research universities with respect to other kinds of research organizations as well as other parts of the educational system. That role is based on educating students—undergraduate, graduate, and postdoctoral—in an atmosphere dominated by inquiry. No other institutions have that capability, nor are they likely to acquire it. It would be easy, however, for research universities to lose it by separating their research activities from the education of their students.

I have the impression that the reports and ideas I have mentioned are familiar to many in the science and research organizations "inside the Beltway," but I am not at all certain that they are being thought about and discussed by presidents, provosts, deans, faculty members, and students at our research intensive universities. We in the associations, as well as our colleagues in the federal government, have to do a better job of disseminating this information and fostering its discussion.

A PLACE FOR LEARNING:

the university and society

For centuries, many societies in virtually all parts of the world have developed and maintained institutions whose major roles have been to serve as places devoted to learning. How that learning is defined, who has access to it, who pays for it, and who benefits, are all parts of a special kind of implied contract between universities and society that is continually being renegotiated. The context for that renegotiation is the desire of society to obtain specific, usually short-term, services from the university, and the desire of the university to remain free of external influences in the development of its general, usually long-term, scholarly agenda. Derek Bok (1982) in his book *Beyond The Ivory Tower* referred to the constant tensions that universities experience "that result from embracing transcendent goals and ideals while having to exist and be of service in a practical, imperfect world" (p. 11).

This talk was presented at "Higher Education: Mission, Competition, Diversity," a colloquium organized at The Hague in February 1993 by the Ministry of Education and Sciences, Zoetermeer and the United States Information Agency.

Historically, the primary service society expected from universities had to do with the role of universities in educating the children (particularly the sons) of their patrons who either individually or collectively usually represented those parts of society that controlled wealth and political power. In their educational functions, universities were seen as instruments for maintaining rather than challenging the status quo and for providing general education to prepare people for their roles as public citizens rather than for any kind of job or career. In exchange for providing this education, university professors were allowed to pursue their own scholarly interests, however arcane they might be. These interests were not seen as being particularly relevant to societal concerns or, for that matter, to the education of students (except those few who wished to pursue scholarly careers). The philosophy was best expressed by John Henry Cardinal Newman in his views that teaching and research were different kinds of activities that might best be kept separate and that the pursuit of knowledge for its own sake, rather than for practical goals, was the only legitimate reason for research in universities. Universities' primary contribution to society came

through the education of members of that society, rather than through any more direct role.

All of these attitudes also form part of the renegotiation between societies and the universities they support. They were most acceptable in relatively stable, highly stratified societies in which the class that supported universities, either through their own financial contributions or through their political influence, were also the only recipients of university education.

During the 19th century major changes occurred in society. The rise of science, the industrial revolution, and the concomitant societal need for more people educated and trained to live and work in this more complex world had a dramatic effect on universities. In the U. S. the Morrill Act of 1862 provided land and federal government support to a group of public universities so that they could expand their academic programs to include more "practical" subjects, open their classrooms to students from a broader range of socioeconomic backgrounds, engage in more scientific and more applied research, and, finally, provide service to the citizens of the states in which they were situated. This service often took the form of direct intervention by university faculty in problems facing local business and industry, particularly agriculture. Universities developed academic programs in the sciences, engineering, agriculture, and other areas, many of which had previously been considered unsuitable in the university milieu.

Universities have continued to grow, not just in enrollment, but in the number and kind of activities in which they engaged. Clark Kerr (1964), with his term "the Multiversity," expressed very well the result of this pressure to be responsive to societal needs (or perceptions of need). Today's multiversities provide undergraduate, graduate, and professional education in hundreds of fields. They provide housing, food services, health services, entertainment and social functions, and a host of other nonacademic activities. Most have some kind of continuing education programs that allow nonmatriculated, part-time students to take courses unrelated to degree programs. These courses vary in nature from regular academic offerings, often given at night or on weekends, to totally unrelated courses that can range from computer programming to Chinese cooking, and which are intended to provide instruction in areas of interest to the local community. Universities are providing education in more fields, at more levels, and to a more diverse group of students than at any time in their history.

In addition, universities have become major producers of research, and while most of this is related to the training of graduate students, a significant part may be directly related to local or national concerns about technical and economic development. The land-grant movement also spurred this development through the organization of state agricultural experiment stations and agricultural extension services designed to help farmers become more productive. This is not to say that until then university researchers had been unresponsive to the

very practical needs of society. For the most part, however, the response had been on an individual rather than an institutional basis. The idea of a university developing units for the specific purpose of working with local businesses and industry is relatively new and represents a complex and interesting set of problems that universities are grappling with today.

Teaching, research, and service are the three terms generally used to describe what society expects from universities, and I want to devote some time to elaborating on each of these terms to determine exactly how they are responsive to societal pressures. First, however, a few words about society. I think we usually take this to mean the constituencies directly involved with the university—either in supporting its activities or in using them. At one time we might have limited our discussion to the former, that is, patrons. These consisted, for the most part, of the federal government for research grants and fellowships, private industry for research contracts, state governments for basic institutional support (in the case of public universities), private donors—often alumni—for support in private and public universities, and, last but not least, whoever was paying tuition. For students, this usually meant parents, not just in their roles as tuition providers, but as citizens who constituted a political force that was important in affecting how legislatures treated universities. Students themselves, even those who paid their own tuition, were not expected to have much of a voice in determining what universities did or how they did it. That situation changed considerably starting in the late 1940s with the appearance on campuses of large numbers of older students supported by the G. I. Bill and intent on getting the most they could from the university. In the late 1960s additional changes took place largely as a consequence of the Vietnam War and the civil rights movement in the United States. Those changes have continued, accelerated most recently by concerns about multiculturalism, human rights, and social justice. Students now have a strong voice on campuses, particularly with regard to the nature of the curriculum and the role of the university in society. Thus, added to the primarily vocational interests of the activist students of the 1950s has been a very different set of concerns about the moral and ethical responsibilities of universities. In all of these concerns students have been joined by faculty members whose own educations were influenced by the events and issues just described.

All of these constituencies have had fairly specific ideas about what they wanted from the universities. Jacques Barzun, writing in 1968 on the American university, commented:

> [Universities] spend huge sums and are desperately poor; their students attack them; their neighbors hate them; their faculties are restless; and the public, critical of their rising fees and restricted enrollments, keeps making more and more peremptory demands upon them. The universities are expected, among other things, to

> turn out scientists and engineers, foster international understanding, provide a home for the arts, satisfy divergent tastes in architecture and sexual morals, cure cancer, recast the penal code, and train equally for the professions and for a life of cultured contentment in the Coming Era of Leisure. (p. 2)

All of these claims may not be equally valid or even sensible, but, as Barzun said, "[T]hey are pressed just the same, and the university must somehow meet them, on pain of being reminded that it lives on charity" (p. 2). These ideas usually have been expressed in terms related to certain kinds of programs or activities, with universities having a free hand in deciding how to carry them out. Even that has changed, and this can been seen by examining some specific cases.

Teaching

The Curriculum

This has not been as much of an issue in the sciences as in the humanities and social sciences. Science and engineering education usually adapts fairly quickly to the concerns of scientists and engineers. The constituents here are the faculty and the professionals in the field. The critical question usually has to do with the balance between theory and practice, with universities perceived as being too much on the theory side. This is a fairly creative tension.

With the exception of the extreme political interference experienced by universities existing in repressive societies, there is not much question about what should be studied, and particularly, what books should be read by students in science and engineering. Society does not get involved in questioning whether or how quantum mechanics or thermodynamics should be taught. This usually is seen as being apolitical. In the humanities and social sciences, however, the situation is quite different. Perhaps the clearest example of this is the debate about the "literary canon" taking place in many U. S. universities.

As multicultural issues, especially those related to sex, race, and ethnicity, have become more important, some students and faculty members have become concerned that almost all of the books they must read as part of their courses have been written by "dead white European men." Women and students of color argue that this has happened not because of lack of merit in the works of others, but because the academic establishment has not valued the work of others. In addition, outrage has been expressed at the idea of requiring courses in Western Civilization only, rather than exposure to other cultures. In an era of intense preoccupation with ethnicity, each group presses the case for recognition of its contribution to world history.

Students and faculty groups have made specific recommendations about what should be taught and what should be read, and this has become highly controversial. The debates on many campuses have been heated and contentious, yet they are, perhaps more than any issue, right in the heart of what

universities have traditionally stated as their most important function, being a forum for the exchange of ideas.

Coupled with multicultural issues is the development of ethnic studies departments and degree programs at all levels. This has been a direct response to student demand for this kind of program and extends beyond ethnicity to gender. The development of women's studies programs, for example, has been a direct consequence of the women's movement in society and the increased number of women on university campuses. For the most part, these all have been conceived as interdisciplinary programs in which the unifying theme is a particular culture, ethnic group, or sex.

Vocational Training

A quite different issue is the proliferation of masters programs that has taken place over the last 40 years. This has been a direct response to the vocational needs of students and employers, and today there probably exist 800 different master's degree titles, most of them descriptive of a specific career field. Individuals with baccalaureate degrees who wish to advance in their fields are encouraged to go back to school to take highly specialized courses in their field of interest. Tuition for many of these students is often paid by their employers.

Professional Accreditation

Some academic programs, primarily at the masters level, must comply with national standards imposed by the profession itself if the program wishes to be recognized as being accredited. Accreditation often has direct economic consequences in that in some fields (i.e., pharmacy) students who graduate from nonaccredited programs may not be eligible to become licensed to practice. Professional accreditation often is very controversial as accrediting groups impose specific curricular, staffing, and facilities requirements that some faculty may disagree with. It does, however, represent a case in which the university is responsive to societal influence.

Distance Learning

As the need for additional educational credentials becomes pressing, many students find that their job and family commitments make it impossible for them to attend school full time, to attend during week days, or to attend universities that are not in geographic proximity to where they live and work. Universities have responded by making educational opportunities available in a variety of ways and at a variety of times and places, geared to the convenience of the students.

Communities interested in attracting certain kinds of industry are likely to press universities to provide education, particularly at the masters level, that would be important to the employees of that industry. Universities have responded by developing a variety of approaches, ranging from interactive

television and computer courses to off-campus centers, all in response to these societal needs.

Research

There have been three major patrons of university research: the federal government, state and local governments, and private industry. Each has seen university research as being essential to its mission. In the case of the federal government, to help preserve national military and economic security; in the case of the states, to foster economic and industrial development; and in the case of private industry, to provide the knowledge and highly trained people required for its successful operation. In addition, the federal government, particularly since World War II, has maintained a commitment to support basic research and the training of scientists at the Ph.D. level. Even so, each of these patrons is constantly faced with the problem of defending its expenditures for the support of research to legislatures, stockholders, and the general public, and the universities are under increasing pressure to be accountable, both fiscally and programmatically, for their research activities.

The past few years have witnessed a series of activities designed to explore the role of university research in responding to public needs. These activities have been mediated through various committees and commissions, usually involving the federal government, and the issue almost always has been the role of university research in economic development and international competitiveness. The reports resulting from these activities have generally advised that universities resist pressures to become industry-like development laboratories and continue to focus their attention on the training of students and the development of research rather than of products.

Those who make the requests are often those who control university budgets. The issue was clearly expressed in a statement issued by the Government-University-Industry Roundtable Report in 1989 entitled *Science and Technology in the Academic Enterprise: Status, Trends, and Issues:*

> State and local officials increasingly urge their public universities to contribute to regional development through applied research and cooperation with resident industries; they recognize that local academic research is often a magnet, drawing high-tech industries and new jobs to an area. As the economic benefits of academic research catch public attention and imagination, political leaders press for a larger and geographically broader academic research enterprise.... Aspiring research universities are under great pressure to develop research capacity; they are also at some financial risk, whether they opt to develop research capacity or not. If they seek to attract a prestigious scientific and engineering faculty, they must invest resources heavily in state-of-the-art research facilities and

> instrumentation; in a competitive academic labor market, even promising younger faculty members can now demand university resources for their research projects and time to establish their research careers before undertaking teaching duties. If, on the other hand, universities do not seek to expand their research capacity, they now jeopardize financial, political, and community support for their institutions. (p. 1–10)

The question of priorities for funding of research, which had in the past been strongly influenced by scientific advisory groups (consisting of university faculty members) working with federal or state agencies, is now much more open, with industry playing an important role, and citizen activists also making their voices heard (for example, in the question of AIDS research).

Service

Much of the service provided to society by universities comes through teaching and research. There are cases, however, when universities become more directly involved. I have already mentioned agricultural experiment stations and extension services which, while they represent teaching and research, bring both to bear directly on the problems of a specific constituency. The extension service has been viewed as a model for dealing with other issues. For example, some universities have developed what might be called an urban extension service to help those who live in cities improve the quality of their lives. These extension programs have their effect by direct interaction with the public rather than through teaching of students.

In Boston a couple of years ago, the School of Education of Boston University took over the administration of the public school system in a troubled local district. Again, the idea was to focus the expertise of the university on societal problems, not through enrolling students in courses or developing research projects, but through direct intervention.

In all of these examples, the issue of access is paramount. For many people, access to university programs is essential to prepare for certain careers. For many industries, access to university research is essential to develop products. For all constituencies access to universities is one way to pursue their own agendas. Thus, the granting or denial of access is fraught with economic, social, and political consequences. Two examples should suffice.

People

Today's students are characterized by their diversity. Not so long ago undergraduate college students were primarily the white, 18 to 24 year-old sons and daughters of parents with enough money or interest to send their children to college. Particular attention should be given to the term send. Parents did indeed send their children and pay for them. Graduate school was almost

entirely the domain of white males, most of whom entered graduate school directly after receiving an undergraduate degree. All of this has changed in a number of ways.

First of all, today's college student may have, as classmates, their parents (or grandparents) who have decided, for a variety of reasons, to obtain or complete a college education. Today's graduate students, particularly those in masters programs, are most likely to have families of their own and to be returning to school on a part-time basis to obtain the training necessary either to advance in the work they are currently doing or to prepare for a new career. They cannot go to classes during the day because they work. They are "place-bound" in that they must find educational opportunities near where they live and work. For the most part, they have very specific ideas about what they expect from the university, and this usually does not include entertainment or social life. They are often older than their professors and not at all shy about demanding value for their tuition dollars. In addition to needing classes at hours other than 9 a.m. to 5 p.m., Monday through Friday, they need services as well, and many universities have found the rapid increase in the number of these so-called "nontraditional" students to be a daunting, but ultimately challenging experience for faculty and administrators alike.

But more than just the age of students has changed. There also have been marked changes in the nationality, race, and sex of students attending the university. A phrase much in use in this context is "historically underrepresented," used to refer to segments of the population who, for a variety of reasons, have been denied access to the university in the past. Perhaps most striking has been the change in the participation of women. Currently, women constitute more than half of all students enrolled in college (at both graduate and undergraduate levels), and their numbers have been increasing every year.

The number of international students has also increased dramatically, especially at the graduate level, where these students comprise 14% of the enrollment and 28% of the doctoral degrees granted. We cannot say the same for U. S. citizen minority students where progress in increasing both enrollment and graduate rates has been slow and irregular. There probably would be general agreement in the U. S. that race is the major issue in American society, and the university, as an integral part of that society, represents a microcosm for this issue. There is little question that access to education is a major factor in providing career options for people, and that until we achieve equal access for all, based only on ability, universities are not fulfilling their part of their bargain with society.

Increased access for many of these groups has come as a consequence of discussion, argument, demonstrations, and legislative pressure, all representing societal needs and societal demands that universities provide education and

training for more than the privileged few. This has required not just attitude changes, but direct financial intervention, usually by the federal government through grant and loan programs that make it possible for more students to attend. Universities as well have committed significant amounts of their own money in financial aid. Most universities in the United States have developed aggressive programs to recruit American minorities, women, students with disabilities, and others who have been "left out" in the past. For universities to have ignored this issue would have represented not just a moral lapse, but, in practical terms, would have been political suicide. Society has changed and universities, to survive, must change with them.

The number of constituencies making demands on universities has grown to the point where the university's response to one is often interpreted as a rebuff to another. A term commonly used to describe allocation of resources is "zero-sum game," meaning that there is only so much money available, and giving to one activity means taking away from another. That is not a new phenomenon, but it becomes especially pertinent in times of declining financial support. In addition, those patrons who sponsor research or other programs in universities also will expect their interests to be served. Supporting this was a recent report from the President's Council of Advisors on Science and Technology (1992) on research-intensive universities and the nation, in which the comment was made that "Research-intensive universities are very complex institutions with many outputs and many patrons, each of whom tends to expect the output it funds to have the highest priority and to be the most heavily subsidized by others" (p. 21).

As all of these pressures—from inside as well as from outside the university—have increased, as more voices demand to be heard and more constituencies demand to be served, universities, individually and collectively, have to face the very basic questions of how they, as institutions embedded in the society that supports them, can best serve that society. This question brings me to the final part of this discussion in which I want to talk about the concepts of institutional neutrality and natural advantage.

Institutional Neutrality

Bok (1982) wrote about neutrality as a form of social contract with society in which universities are given "the greatest possible freedom from outside interference with their teaching, research and educational policies" in exchange for being "willing to . . . refrain from taking official stands or exerting collective pressure in behalf of its own political objectives" (p. 6). But he questioned the validity of this idea if it is misunderstood to mean that universities should have "no institutional values or moral commitments" (p. 299). Universities are not simply passive partners in their relationship with society. They represent a culture, a perspective, a set of values, and a sense of morality, and these must be factored into any discussion of the relationship.

There are two related but essentially different issues here. Society must be able to rely on the unbiased or neutral nature of university research and teaching. The solutions to problems or the answers to questions must not be determined by what a particular patron or constituent wants them to be, but by the concept of disinterested scholarship, that is, scholarship unaffected by the personal, financial, or political interests of the sponsor, the investigator, or the institution. Here, universities must be neutral.

At the same time universities have not and cannot remain neutral in a variety of situations where demands or requests are made that are viewed as being inimical to the culture of the institution. Perhaps the best example is the concept of academic freedom. Most academics believe that the free and open exchange of ideas is essential if a university is to serve as a place for learning. But that concept may not be widely understood or accepted in society at large and may, at times, run counter to political pressure. Examples abound of university professors losing their jobs or even their lives because of their beliefs in the academic freedom to express their views, controversial as they may be. In some cases professors have been supported by their universities, often with disastrous consequences for the universities. In other cases they have not, and here the consequences may be even worse, though more abstract. There are other examples, ranging from classified research and research on weapons to stock divestment and opposition to racism, where universities are looked to by their students and by their faculty for leadership and clear positions on contentious issues.

Natural Advantage

In talking about neutrality, the point was that there were issues of principle that could lead universities to oppose societal requests on the basis that they were antithetical to the idea of a university and the humanistic, scientific, and scholarly concerns it espouses, and, for the same reason, to insist on taking certain positions, even though there was societal pressure not to do so. There is another quite different kind of reason for universities to decline to comply with society's requests. That is that universities are not institutions with an infinite capacity to respond to the requests of their constituents, and they must choose what they do based on some concept of what they are. The issue here is not whether the university could comply; it is whether universities should comply. Again, examples can be drawn from the three major university activities, but are most direct in the case of research.

There are continuing pressures, particularly from funders of research, for universities to work more closely with industry. Much of this is not new, and much is entirely appropriate. But there are those who believe that universities should do much more applied research and development, particularly to assist local industry that may not have the staff or faculties to carry out this kind of work. The consequences of such a move are a cause for concern. The issue was

most clearly described by J. C. Williams (1986), then dean of engineering at Carnegie-Mellon:

> Industrial sponsors tend to encourage university researchers to tackle problems that are too focused or have a very short pay-off period. When this happens the university essentially becomes a surrogate applied-research or problem-solving activity for the sponsor. Universities have no natural advantage in such activities. Moreover, narrowly defined problems restrict the extent to which the creative abilities of faculty and graduate students can be used. Faculty find themselves faced with a dilemma when conducting short-term research. In a sense, the sponsor is deprived of one of the principal advantages that university research has to offer: access to creativity, originality and intellectual strength. (p. 323)

Universities and sponsors both lose when universities are diverted from what they do best. What then is the natural advantage of universities?

Jaroslav Pelikan, writing in *The Idea of a University* (1992), commented that no one institution can do it all, satisfy every patron, investigate every problem, teach every subject. But he raised the question, are there "any activities or fields whose absence or neglect should disqualify the institution from a claim to the name university" (p. 76)? He believed there are, and that they include:

> advancement of knowledge through research; extension of knowledge through undergraduate and graduate teaching; training that involves both knowledge and professional skill in the professional programs or schools of the university; preservation of knowledge in libraries, galleries, and museums; and diffusion of knowledge through scholarly publication. (p. 76)

He conceded that there are other things universities may do from time to time and place to place, but these are not what define the institution. Instead, he suggested that these broad and generic activities are "the things it ought to be doing if it wants to be a university—and . . . that in one way or another, it probably ought to be doing all of them to qualify" (p. 76).

This is one way of describing the natural advantage of the university—a place where all of these activities take place and where they influence each other. Robert Rosenzweig, in his book *Research Universities and Their Patrons* (1982), approached it somewhat differently by saying, "A research university is one whose mores and practices make it clear that enlarging and disseminating knowledge are equally important activities and that each is done better when both are done in the same place by the same people" (p. 1).

Other institutions do research, but not in ways that interact with teaching; other institutions teach, but not in ways that interact with research. When a

university strays too far from those attributes that define its natural advantage, it loses precisely those identifying features that form the basis of its claim on societal support.

Conclusion

There are three images I want to leave with you. One is the social contract, or perhaps treaty, continually being renegotiated as societies and universities change and based on the idea that society will provide support for universities in exchange for certain services. The second is the idea of institutional neutrality and what it means (and does not mean) in describing the interaction of universities and society. And finally, there is the idea of natural advantage and how that concept affects the renegotiation. The image of the continually renegotiated contract implies adaptation to change. The ideas of institutional neutrality and natural advantage describe boundaries within which universities negotiate the extent and nature of that adaptation.

DÉJÀ VU *all over again*

A rich literature exists, largely in the proceedings of meetings of graduate deans, on the role of graduate education, specifically doctoral education, in preparing people to teach in colleges and universities. Perusal of this literature leads me to suggest that there are three principal features that characterize this issue: durability, periodicity, and rediscovery. Let me explain. The preparation of faculty is a long-term interest of graduate deans (and indeed, of most academic deans). The intensity of this interest waxes and wanes and tends to peak about every 15 years, at which time academic administrators and higher education associations make recommendations, usually based on task force reports, that are essentially identical to reports made earlier.

With the subtitle, "The Role of Graduate Schools in the Preparation of Faculty," this article appeared in the Spring 1993 (Vol.79, No.2) issue of Liberal Education, the publication of the Association of American Colleges, now the Association of American Colleges and Universities.

In 1948, the Association of Graduate Schools (AGS) of the Association of American Universities (AAU)—a group of 32 of America's most prestigious universities—at its 49th annual conference discussed a report on the proper training for the Doctor of Philosophy degree (Association of American Universities [AAU], 1948). Part of this report dealt with preparation for teaching. It suggested that "certain steps should be taken to improve the teaching ability of those who receive the Ph.D. degree and plan to make their careers in the academic field" (AAU, p. 112). Among those steps were:

- selecting "at an early stage students who are interested and qualified for college teaching" (p. 113);
- providing support for them "through fellowships, assistantships, and . . . an integrated program" (p. 113). The report emphasizes "that the training of college teachers cannot be divorced from the subject matter [of the] department," and that "the supervision of young teachers should be carefully planned by these departments" (p. 113);

- insisting on broad undergraduate education as a basis for those entering graduate school "especially in fields in which advanced training usually leads to teaching careers"[5] (p. 113); and
- recognizing that there is more to producing a finished college teacher than programs in graduate school. It involves experience and continual self-improvement, and much of this is a shared responsibility of the teacher and the employing institution.

Many of the graduate schools present at that meeting reported some kind of activity designed to prepare college teachers. But perhaps the most revealing comment occurred during the discussion. It is attributed to Fernandus Payne, dean of Indiana University (In those days verbatim transcripts of all discussions were published.):

> Mr. Chairman, I just want to call the attention of this group to the fact that about fifteen years ago, a similar report to this one was made to this body, and I am happy to say that essentially the same recommendations were made then as have been made today. That report at that time was made in response to the criticisms of the Association of American Colleges. They wrote a letter to us saying that we were sending them poor teachers. (AAU, 1948, p. 116)

Graduate Education and the Colleges

Dean Payne's remarks certainly lend credence to the idea that reports about matters in higher education tend to repeat themselves. But they also establish a relationship between AAC and the graduate deans. A liaison committee between AAC and the Council of Graduate Schools (CGS) was established in 1965. In 1967, this committee produced a report, *Preparing the College Professor for Liberal Arts Teaching*, that restated and expanded upon almost all the points raised in 1948, with particular attention to the supervised teaching experience or teaching internship. A few years later Gustave Arlt, first president of the Council of Graduate Schools, pointed out, "The training of college teachers has for about five years been a joint concern of the Association of American Colleges and the Council of Graduate Schools (Arlt, 1971).

In the early 1980s, several studies dealing with the problems of undergraduate education appeared. Particularly pertinent to a discussion of graduate education are William Bennett's (1984) *To Reclaim a Legacy: A Report on the Humanities in Higher Education* and AAC's (1985) *Integrity in the College Curriculum*. Among other things, both viewed many of the problems in undergraduate education to be directly attributable to graduate education, because "many graduate schools

[5] This recognition that good teachers must be educated broadly as well as in depth brings to mind Jaroslav Pelikan's comment in 1983 that "The difference between good scholarship and great scholarship is, as often as not, the general preparation of the scholar in fields other than the field of specialization" (p. 26).

have become so preoccupied with training narrow specialists that they no longer address adequately the more pressing need of higher education for good teachers" (Bennett, 1984, p. 19), and because of "the failure of the graduate schools to prepare holders of the doctorate degree for careers in teaching" (Association of American Colleges, 1985, p. 35).

In response to these and other reports, the Council of Graduate Schools invited Robert Voelkel, then vice president and dean of the college at Pomona College, to participate in a session on the subject at its national meeting in 1985. His presentation was in many ways eye-opening. He had asked all of the assistant professors at his institution what he should say to the graduate deans; they were united in their response that graduate school did not prepare them to teach. "Even those who had held assistantships, taught courses, been in colloquia designed to raise educational problems, and were interested in teaching issues testified to the feeling that graduate schools and graduate professors could care less about teaching and made this feeling clear to them" (Voelkel, 1986, p. 1). Devastating, but unfortunately not surprising.

On the other hand, Voelkel (1986) observed that "the very junior faculty members who were complaining the most about their lack of preparation in teaching have quickly adapted to the College and are successful teachers generally well respected by their students and colleagues" (p. 2). He suggested that perhaps the metaphor of the master training the apprentice in the skills of teaching is incorrect and should be replaced by the idea of "the man or woman of learning shar[ing] his or her intellectual life" (p. 8). Applied to graduate professors and their students, this intellectual collegiality is, according to Voelkel, the major contribution graduate education makes to the training of teachers. This led him to propose that if young faculty are concerned that they were not taught how to teach, it "may well indicate a lack of understanding that they are not merely to train apprentices but to share with their students an intellectual quest" (p. 8).

These remarks suggest that, at least in part, the education of college teachers occurs as learning incidental to the process of becoming a scholar. Indeed, the purpose of doctoral education may not be to prepare scholars and teachers at all, but rather to prepare people to become scholars and teachers. This idea is embedded in the 1948 report mentioned at the outset (AAU, 1948), which placed responsibility for finishing the job on the individual as well as the employing institution.

The Education of Teachers

How does graduate education prepare people to become teachers? There is surprising agreement on many points. Deep knowledge of one's field is an absolute prerequisite. Graduate schools do that pretty well, mostly through a combination of classwork and research. Added to this, however, must be the

ability to share this knowledge and understanding with others. Graduate education participates here too, largely through seminars and other opportunities for students to describe their work to colleagues—that is, people who understand the basic dimensions of what is being described. Some graduate schools also provide opportunities for graduate students to engage in discussions of the role of the faculty member. Perhaps the best example of this is the Duke University experience that led to publication of *The Academic's Handbook* (DeNeef, Goodwin, & McCrate, 1988), a record of a 2-year long symposium on this topic. Of course, many departments require that graduate students participate in seminars and discussions devoted to the issues involved in teaching in a particular discipline.

It is the next step that is the most difficult, however. That is to use one's understanding of a subject to help others learn. The 1967 Association of American Colleges and Council of Graduate Schools report mentioned earlier stated the issue in these terms:

> Often real breadth in the intellectual development of a young college faculty member begins with his first teaching assignment when, perhaps for the first time, he is forced to communicate the basic concepts of his subject matter to students with little background in his discipline, in ways which are perceived by them as meaningful and relevant. (p. 8)

This is an old problem, and it is exacerbated by a low level of general preparation of students. Gerald Else, a classicist, speaking at a meeting of graduate deans in 1961 (Henle et al., 1961) bemoaned the fact that most entering graduate students in his field no longer had Latin and Greek firmly in hand at the time they entered graduate school. G. B. Harrison (1973) wrote a dozen years later about the difficulty of teaching English literature to students unfamiliar with the Bible and classical mythology. Examples of poor preparation in mathematics and science are legion.

This situation necessarily affects the nature of teaching at the college and, to some extent, at the graduate level. It is not enough for college teachers to simply plant and cultivate ideas in the prepared mind of the student. Today's college teacher is often faced with the challenge of preparing that mind, in terms of both its store of knowledge and its ability to use it, as a prelude to the consideration of ideas and conflicts of ideas.

The Teaching Assistantship

The teaching assistantship provides some opportunity for this talent to develop, particularly when it is viewed by both the TA and the faculty of the department as an activity designed for this purpose rather than just a way to earn a living while working on an advanced degree. Speaking to a group of

graduate deans in 1961, Kenneth Pitzer, a chemist who would later become president of Rice University, put it this way:

> If senior professors will really give some attention to graduate students during their teaching experience, I am sure they can create a sense of importance of teaching, and, in addition, convey a great deal of information about techniques and principles of good teaching performance. Then we can have good teachers in the universities in the years ahead, as well as able scholars and research contributors. (Henle et al., 1961, p. 64)

During the past few years there has been a good deal of progress in this area. Biannual conferences on the training and employment of graduate teaching assistants, begun in 1986, have brought together graduate students, faculty members, and administrators who are seeking ways to use the TA experience as a way to improve undergraduate instruction while helping graduate students learn to teach. This is a new kind of activity and interest. As Ernest Boyer said in his opening remarks at the second of these conferences in 1989:

> It is almost unthinkable that twenty or even ten years ago representatives of all areas of the Academy would have gathered together to inquire into the quality of teaching and how we can, in fact, strengthen the role of teaching assistants in higher education. (Boyer, 1991, p. 3)

Other Approaches

An extension of the TA experience or the supervised teaching internship is exemplified by the AAC interinstitutional project, *The Next Generation: Preparing Graduate Students for the Professional Responsibilities of College Teachers* (Slevin, 1992). One distinctive feature of this project was that graduate students had opportunities to encounter other academic cultures.[6] AAC's project emphasizes the value of involving graduate students and faculty members in the intellectual and pragmatic issues of teaching.[7]

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[6] It is interesting to note that in a presentation to graduate deans made in 1949, Howard Mumford Jones talked about the problems of moving from being a graduate student at a university to being a faculty member at a college and suggested that "If, in the last year of his training, the future college instructor could be required to go and study some college radically different from the university . . . we might move more decisively to eradicate or lessen the pangs of academic adjustment" (p. 60).

[7] This is true even at the undergraduate level. Frederick Campbell (1990), in *The Ford Foundation Initiative in Undergraduate Education*, a report on a group of programs designed to improve undergraduate education and recruit the next generation of college professors, commented that in addition to the usual exposure to research that characterizes these programs, some of them involved undergraduates as teaching apprentices, both in the actual teaching process and in the discussion and development of courses. He concluded, "The most surprising lesson of the initiative is the power which involving students in teaching and course development has in motivating and preparing them for an academic career" (p. 23).

Perhaps the most serious disagreement about preparing graduate students to become teachers concerns the involvement in this process of professionals in the field of education. The early literature is filled with warnings by graduate deans and arts and sciences faculty members to avoid those in the colleges of education. More recently, however, there has been growing acceptance by those outside the field of education of the scholarly legitimacy of much of the work done on the processes of learning and teaching. This has led to the realization on many campuses that the best way to approach the problem of preparing people to become teachers is to use all of the resources available and to treat the subject of teaching in both its general and specific aspects.

It is how we conceptualize teaching, however, that ultimately will determine the quality of what we do in universities. Teaching must be understood as a scholarly activity. We assume that research is the logical and desired outcome of training for scholarship. But we must recognize that scholarship defines the process we use to refine and transmit the results of research so we can understand the current state of knowledge and speculate intelligently about the future. In that light, teaching also becomes a logical and desired outcome of scholarly training (LaPidus, 1987).

Ernest Boyer (1990) in *Scholarship Reconsidered* expanded on what he calls "the scholarship of teaching," pointing out that "when defined as scholarship ... teaching both educates and entices future scholars" (p. 23). That alone is reason enough for graduate schools to promote scholarly teaching at all levels.

Conclusion

The ideas, activities, and projects described here represent some of the things we have learned about the role of graduate education in preparing people to become teachers. All of them have risen from time to time, flourished for a while, and then faded from view, casualties of the imperatives of business as usual. They do not disappear, however. They are still there, lurking in the literature, growing stronger and more credible each time they are rediscovered. We have begun to bring them out again, but this time we should recognize them for what they are—not curiosities to be studied for a while and then put back, but rather missing parts that we need if graduate education is to fulfill all of its promise.

SCHOLARSHIP AND RESEARCH: *Gresham's law revisited*

Some years ago, in a speech entitled *Gresham's Law: Knowledge or Information?* Daniel Boorstin (1980), then Librarian of Congress, commented, "In our ironic twentieth-century version of Gresham's law, information tends to drive knowledge out of circulation.... The latest information on anything and everything is collected, diffused, received, stored, and retrieved before anyone can discover whether the facts have meaning" (p. 3). He suggested that one way to understand the difference between knowledge and information was to realize that while you can inform people, you can't knowledge them. That is one of the great truths in education. The integrative, synthesizing activity that produces knowledge takes place in someone's mind. You can't buy knowledge or receive it as a gift; it is a personal possession obtained by an active process. You have to do it yourself.

The influence of Daniel Boorstin's writing about knowledge and information is seen in several of the author's writings, but this one is most directly on the topic. It first appeared in Communicator in January 1996.

Several years later, Ernest Boyer (1990) wrote *Scholarship Reconsidered,* in which he did just that. Among other things, Boyer observed that, "Surely, scholarship means engaging in original research. But the work of the scholar also means stepping back from one's investigation, looking for connections, building bridges between theory and practice, and communicating one's knowledge effectively to students" (p. 16).

Boorstin's distinction between information and knowledge and Boyer's expansion of the idea of scholarship that takes it beyond research, led me to think about the relationship between these sets of terms. For many, the term research conjures up images of scientists working in laboratories, while scholarship conveys an image of solitary figures, perhaps in libraries, pondering "over many a quaint and curious volume of forgotten lore." But these are Hollywood images. I believe there is a real and important difference between the terms. Research is something you do. Scholarship is the way you think about it. Combining this with Boorstin's idea suggests that research is a process for obtaining information and that scholarship is a process for turning information into knowledge. That is why research can be done by teams and scholarship cannot. We have research assistants; we don't have scholarship assistants. Researchers usually ask questions like where, when, who, what, how

many, how big, or how fast. Scholarly questions are different. The most common undoubtedly are why and how, usually accompanied by two others. One is a critical question, "So what"? The other is a visionary question, "What if"?

Defining research and scholarship in this way also helps to clarify some recent discussions about graduate education. For example, an editorial in *Science* entitled "Reorientation of Research Objectives" referred to comments by John Armstrong, former vice president for research at IBM:

> [T]he academic science and engineering faculty need to reevaluate the relative importance of research results and other aspects of the training leading to the Ph.D. The research results are usually in a narrow field. What the Ph.D.'s know "that is of lasting value is how to formulate questions and partially answer them, starting from powerful and fundamental points of view." (Abelson, 1994, p. 755)

Industrial research and technology managers who deal with a variety of different kinds of problems tend to agree with this point of view, recognizing that what has carried over from their own doctoral studies is not the specifics of their dissertation research but the generalizability of the scholarly process.

Academics, many of whom continue to work in areas closely related to their doctoral research, may not always remember this. Perhaps that is why one of the major issues in universities has been described for years in terms of the relationship between research and teaching, when in reality the important relationship is that between scholarship and teaching. What needs to come strongly into the classroom is not so much the results of the latest research, but how a trained scholar reads and listens critically, defines and analyzes problems, determines what the important questions are, decides what research needs to be done and how to do it, understands what the results mean, and learns from the process. These qualities should be cultivated in all classrooms at all levels.

We are going through a period of intense interest in the purposes and processes of graduate education. At the doctoral level, much of the discussion has focused on the consequences of overspecialization in teaching as well as research and on how universities might do a better job in preparing students for both of these activities. In a very direct way this is part of the message in the recent report, *Reshaping the Graduate Education of Scientists and Engineers*, from the Committee on Science, Engineering, and Public Policy (COSEPUP, 1995) of the National Academies. That report stressed the idea of a broader preparation for doctoral students, one that would give them a larger context within which to place their research specialization. The emphasis is on making students more versatile so that they have a wider range of career options available to them. But the benefits to be derived from this kind of approach can go far beyond that if students are encouraged to extend their abilities as scholars. As Boyer (1990) has commented, "The scholarship of discovery, at its best, contributes not only

to the stock of human knowledge but also to the intellectual climate of the college or university. Not just the outcomes, but the process, and especially the passion, give meaning to the effort" (p. 17).

Scholarship and Research, Knowledge and Information—these academic couplets represent the essential components of the university. Scholarship and knowledge are absolutely dependent on research and information, but the reverse relationship does not hold true. Information and research can exist alone, and when they do, they can drive out scholarship and knowledge. There is a kind of dynamic balance that can easily shift too far in the direction of short term answers and away from long term questions. But the issue is not research or scholarship. The issue is scholarly research or nonscholarly research, and in the university, there is never a reason for nonscholarly research.

Ph.D.s AND JOBS:
a world they never made

During the past few years the public, academic, and scientific press has been filled with articles about overproduction of Ph.D.s, often referred to as the "Ph.D. glut." Major professional organizations have described high rates of unemployment or underemployment for new Ph.D.s, and leading figures in industry, academia, and government have expressed the opinion that we have an oversupply of Ph.D.s in almost all fields. All of this has led to a national discussion about the size and nature of doctoral programs, with many calling for a reduction, either in the number or size of these programs, based on the current and projected availability of jobs for those with the Ph.D.

A shorter version of this paper appeared in The Chronicle of Higher Education on November 14, 1997, under the title, "Why Pursuing a Ph.D. is a Risky Business."

Once the initial flurry of newspaper articles subsided, there was some attempt to look at the data. The unemployment rate for Ph.D.s is between 1% and 2%—1.5% in the sciences and engineering; 1.7% in the humanities (Committee on Science, Engineering, and Public Policy [COSEPUP], 1995). From those figures, it is hard to justify terms like "glut" or "crisis." Nevertheless, anecdotal evidence, as well as surveys conducted by some professional societies, indicate that many Ph.D.s are having difficulty finding the jobs they want, especially if those jobs are tenure track positions at research universities.

In this climate, encouraging students to consider going to graduate school, particularly to pursue the Ph.D., has been viewed by some as being immoral and exploitative. A picture has emerged of bright but naive undergraduate students being enticed by ambitious and unscrupulous faculty to undertake many years of graduate education, often as poorly paid teaching or research assistants, in the expectation of getting faculty jobs in research universities. Since most students don't get these kinds of jobs, there is a lot of resentment, and some new Ph.D.s feel they have been misled or deceived.

Although there had been a long-standing concern about the academic job market in the arts, humanities, and social sciences, the intensity rose dramatically starting in the mid 1990s. It became apparent that a number of unpredictable events were confounding the projections of excellent academic job prospects for Ph.D.s, and more significantly, that for the first time since the early 1970s, newly-graduated scientists and engineers were encountering difficulties finding research-related jobs in industry as well as academia.

The considerable literature that developed about Ph.D.s and jobs was dominated by several themes:

> universities had overproduced Ph.D.s by not letting "the job market" influence the size of their doctoral programs;
>
> faculty members were deliberately misleading students into going to graduate school to maintain a source of cheap labor for undergraduate teaching and to help with faculty research projects; and
>
> students, having survived the rigors of graduate school and obtained the Ph.D., were "entitled" to jobs doing independent research, preferably as tenure track faculty in research universities.

A recent statement by a doctoral candidate seeking an academic job captured the essence of these issues. "There were supposed to be all of these retirements and turnover, but there is a whole generation now that's been deceived" (Wilson, 1997, p.A10). The letters to the editor that appeared in response to the article about this student contain phrases like "an indictment of higher education and its managers," "She is an individual who was seduced into participation in an increasingly nasty 'industry,'" and "the ethical failure of graduate programs ... that continue engorging the academic meat market with surplus Ph.D.'s."

These bitter words indicate more than a vague uneasiness about the state of doctoral education and would certainly suggest that, in the eyes of some, graduate students really are helpless pawns being ill-used and exploited by an uncaring establishment.[8]

Sam Rayburn, legendary speaker of the House of Representatives in the 1940s and '50s was once quoted as saying that the three most important words in

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[8] This view of graduate student life could almost lead one to believe that students were being shanghaied, a practice described in the novels of Patrick O'Brian, who writes about the British navy in the early 19th century. In those days, groups of seamen, called "press gangs," led by an officer, would tour the waterfront taverns, looking for men who had succumbed to the drink. These wretches would be hauled away, to awaken the next day, miles out to sea, bound for far away places, with no hope of return for many years. They had to learn to be sailors, to go aloft in howling gales, to bend their backs to the oars when their ship was becalmed, and other things too terrible to mention. They worked long hours for little money, experienced miserable working conditions, and their lives and well-being were in the hands of officers who might be mentors, martinets, or madmen. When it was over and the ship came home, many of them found they could not go back to their old lives and so they signed up for another voyage. Since this happened after their ships had docked, these poor wretches might even have been known as "postdocks." Could it be that graduate programs are filling their rosters the way the British filled their ships? The following scenario comes to mind:

Professors, perhaps accompanied by their graduate students, cruise the campus bars seeking high grade point seniors with good GRE scores who have passed out after a night's carousing. These poor devils are dragged off and awake to find themselves graduate students, with no hope of completing their degree programs for many years. They are expected to learn to be scholars, to do research, write papers, give seminars, and engage in other activities too horrible to mention. If they are particularly unfortunate, they may be forced to teach undergraduates. They work long hours for little money, often experience miserable working conditions, and their lives and well-being are in the hands of professors who might be mentors, martinets or madmen. It is a story filled with loneliness and disappointment, of men and women, good and true, whose lives have been embittered and whose hopes have been dashed on the rocks of despair. When it is over, and they have their Ph.D.s, they often find their prospects so dismal that they sign up for another tour. Since this happens after they receive the doctoral degree, they have come to be called "postdocs."

Washington were "Wait a minute!" I want to echo those words, because several things about this picture bother me. One is the implication that students are somehow being enticed into going to graduate school against their will or better judgment. For years, critics have questioned the wisdom of pursuing the Ph.D., since the assumption has been that people smart enough to go to graduate school could do a number of other things that might be more profitable. Taking 6 or 8 or more years to get a Ph.D. could be considered an economically irrational decision in terms both of foregone income and future earning potential, but no one has ever suggested that students had no choice.

The majority of students entering Ph.D. programs do so because they are intensely interested in specific fields of study and hope to find careers in those fields. In some fields, job prospects have never been very good, but in the peculiarly American form of free choice that we have, there has been no attempt to restrict access or prevent students from enrolling in programs that might not lead to jobs. The idea of developing some kind of method for controlling the size of graduate programs in relation to supply and demand projections has never been particularly attractive or reasonable. The real question has been, who pays? Public or institutional support has often been reduced or withdrawn when the case is made that few jobs are likely to exist for graduates. But some programs continue to exist, and some students continue to seek them out, driven by desire, enthusiasm, and hope, attributes held in high esteem in our society. Certainly faculty have encouraged good students to consider going to graduate school, and there has been a particular interest in recruiting minorities and women into the sciences and engineering, but, as far as I know, no one is being forced to study for the Ph.D.

With regard to support for doctoral students, many get teaching or research assistantships that involve a stipend (usually $8,000 to $10,000 per year) and some kind of tuition scholarship, often covering full tuition. I believe this situation is unique to graduate education and does not occur in medicine, law, or a host of other fields where students expect (and are expected) to pay their own way through various combinations of full or part-time work, savings, and loans. Being able to work as a teaching or research assistant in exchange for a stipend and tuition is a boon, not a burden.

Finally, some people seem to believe that doctoral education is basically different from any other postbaccalaureate degree programs in that the institutions that provide the education are somehow morally responsible for ensuring that graduates get the jobs of their choice. I know of no other field where this is the case. It doesn't happen with physicians or lawyers, many of whom don't get the residencies or clerkships that they want or who find themselves in jobs different than those they expected, some of them far removed from their training, and some in totally different fields.

Many institutions provi[illegible] career counseling centers, and anecdotal evidence indicates that many, if not most, faculty members try to help their students find jobs. But that is a far cry from the comment by a self-described "disgruntled, underemployed, underfunded, and almost disenfranchised Ph.D. scientist" who recently suggested that "any educational institution which grants a doctoral degree to someone must, if that person becomes unemployed for a significant time, provide him or her with a full-time position at that institution with an office, laboratory, and start-up funds" (Floyd, 1997, p. 183).

CGS vice president for research Peter Syverson (1997) has commented on the increasing complexity of the Ph.D. labor market and on the difficulties involved in making sense of the many reports and articles. A major problem is that to many, the term Ph.D. job market means tenure track positions in research universities. That is simply wrong. Research universities (depending on how they are defined) make up between 3% and 5% of the institutions of higher education in the United States. Doctoral granting universities constitute about 13% of the total. Most students who get Ph.D.s don't get jobs in universities that grant Ph.D.s, and never have, at least not within the memory of today's faculty and administrators. In fields like chemistry and engineering the majority of Ph.D.s have not gone into universities at all, but rather into business or industry. In either case there never have been guarantees that anyone would get the position most desired, although the chances were better 20 or 30 years ago than they are today.

The employment situation is highly dependent on field. About one half of all doctoral recipients are employed in academic institutions. The rest are employed in a variety of sectors. In some of the physical sciences, and in engineering, industry is the primary employer. Social scientists may seek government jobs. Options available to psychologists include private practice or work for mental health organizations. People with Ph.D.s in education often go into school administration. In fact, people with Ph.D.s in all fields may find themselves in jobs and careers that are quite unrelated to the specific aspects of their doctoral education. None of this is new or news. American doctoral education is characterized by the strong preparation given to students that enables them to use their skills in a variety of ways. This simply demonstrates once again that America's investment in doctoral education returns dividends in many sectors of the economy and that doctoral education is not job training.

A number of critics have expressed shock and amazement that the state of the job market does not play a greater role in influencing departmental decisions about how many students to admit to doctoral programs. If one were to list the factors involved in determining the number of students that could be served by a doctoral program, that list would include things like student demand, the quality of applicants, student support (research assistantships, teaching assistantships, fellowships), research support (faculty research grants, training grants), availability of faculty advisors, laboratory space, equipment, library

facilities, institutional mission, and so on. Far down the list, if there at all, would be someone's opinion about what the job market will be when the student graduates.

Attempts to predict or project the state of the job market 5 or more years in the future have failed dismally. The world we live in is not characterized by stability, but by rapid and unpredictable change—social, political, economic, scientific, and technological. In the late 1980s some of the most respected observers of higher education projected that there would be high demand for faculty members and for scientists and engineers by the mid to late 1990s. Most people agreed. Counseling good undergraduates to consider studying for the Ph.D. was widely believed to be good advice, both for the student and for the intellectual and economic health of the nation. Many people believe that it still is, so long as students understand that being admitted to graduate school does not guarantee a degree, and that a degree does not guarantee a job.

Recently, first year graduate enrollment in several fields (e.g., physics and engineering) has declined. Some of this decline may be due to a good market for baccalaureate degree holders—for example, in engineering—but some is undoubtedly reaction to the unremitting publicity about the lack of jobs for Ph.D.s. It may be almost time to write the article titled "The Forthcoming Shortage of Ph.D.s in Science and Engineering."

All of the above being said, a serious problem exists when smart and motivated young people spend 5 to 7 years as graduate students getting a first-rate education, and are then told that they are surplus goods in a glutted market. Several universities have made specific efforts to reduce the size and alter the structure of their doctoral programs. Some of this is a response to the current, highly publicized view that there is an oversupply of Ph.D.s, but much of it is related to waning university resources, both for the support of students and research. There is a growing tendency to provide better and more continuous support to smaller numbers of highly qualified students. This should decrease the time spent earning the degree, increase completion rates, and effect general improvements in the quality of the graduate experience. More attention is being paid to advising and mentoring, and efforts are being made to inform students about choices that will broaden their education as well as their career options. Cryer (1997) provided much good advice for students and doctoral programs and suggested that "PhD students need to think further than their subject expertise. They need to be able to sell those skills and abilities developed during the process of the PhD and which are valued in wider settings" (p. 1). All of these are good ideas, but there is an entirely different aspect to consider that may be even more important.

That faculty members describe the joys of "the life of the mind" in glowing terms, and try to convince promising students to at least consider choosing such a path, is not surprising. Many faculty members enjoy the life they lead. They are

involved with interesting problems and interact with interesting people. For the most part, they are deeply committed to their scholarly work and are eager to share it with colleagues and students. There is a growing realization, however, that some doctoral students, particularly in our most prestigious institutions, believe that unless they find jobs like those held by the faculty at their graduate institutions, that is, tenure track positions in research universities, they are second-rate at best, and probably failures. This belief apparently is fostered, explicitly and implicitly, by the actions and attitudes of some faculty members. If this is true, (and there is much anecdotal evidence to support it) it is difficult to overstate the damage it causes. Since most graduates don't find these kinds of positions, they are left wondering whether they or their graduate programs are inadequate, when in reality the problem is lack of exposure to the wide variety of possibilities available to people with their education and skills, coupled with widespread academic chauvinism. The term "alternative careers" is often used when referring to nonacademic jobs, implying a clear preference. It is not a mistake to urge students to consider graduate education, or to pursue the Ph.D., or to become intensely involved in scholarly research. It is a dreadful mistake to convince them that their education restricts, rather than expands, their options.

Pursuing the Ph.D. has always been a risky business. There is a chance that students may not be accepted at the school of their choice, that they may not get financial support, that they may not complete their programs, and that they may not get the jobs they want. People do it because they want to, because they are interested, because they know that there always are some jobs, and because they are confident that they are good enough to get one. Sometimes it works out, sometimes it doesn't. While they are in graduate school most students are active in research and scholarship, and they produce much of the information and knowledge upon which this country builds its economic, intellectual, and scientific future. For some, this may be their only opportunity to do this, and they will go on to different kinds of activities. For others, the work done in graduate school will be a prelude to a career in research and perhaps teaching. In either case, they will have spent part of their lives doing what interests them most.

Supporting this kind of educational preparation has been considered a good investment of public funds. Students will have to decide if they believe that doctoral education is a good investment of their funds and their time. If they do, they will go to graduate school; if they don't, they will do something else. In either case, the decision will be theirs.

DOCTORAL EDUCATION: *preparing* for the future*

* prepare *vt:* to make ready beforehand for some purpose;
it: to get ready.

Virtually all discussions of graduate education involve the idea of preparing students for some kind of professional activity, that is, for jobs and careers in which they use the knowledge and skills that were the focus of their graduate education. For the most part, however, Ph.D.s are prepared to do certain things, but not for work in any particular sector. Preparation for jobs or careers, in the sense of particular and specific training, occurs rarely. This is quite different for most masters programs, where the needs of the profession shape the majority of programs, and students are specifically prepared for professional practice.

This often-requested paper appeared as a special edition of Communicator in November 1997.

Doctoral education really attempts to prepare people to become scholars in a host of fields and disciplines. This is entirely consistent with the idea of the research university as a place where students and faculty seek knowledge together. It probably is true that, particularly in the most prestigious departments, there is a strong bias toward academic careers, specifically in research-intensive universities. But even in these cases, the only preparation for these academic careers is likely to be training in research. Indeed, in other countries with a tradition of doctoral education directed almost entirely to the preparation of faculty, the only requirement for postgraduate students is that they demonstrate the ability to do independent research.

The ability to successfully carry out an independent research project has long been thought of as the primary and perhaps the sole criterion for obtaining a Ph.D. With few exceptions, however, employers of Ph.D.s assert that this is not the only thing they are looking for. Opportunities to function as an independent investigator are increasingly limited. In an interview in 1994, Bruce Alberts, president of the National Academy of Sciences, was asked if we should be producing fewer Ph.D.s. His answer was, "[I]f we're going to train with a very narrow Ph.D. that's really designed for people to be independent researchers, then we shouldn't be training so many" (Greenberg, 1994, p. 2). Similarly, in a

government paper on science produced in England in 1993 the following statement appeared:

> [The government] is concerned, however, that the traditional PhD does not always match up to the needs of a career outside research in academia or an industrial research laboratory. A minority of those studying for a PhD in science, mathematics and engineering can realistically expect a long-term career in university research.... The majority will move into other fields." (Chancellor of the Duchy of Lancaster, 1993, p. 57)

Taken at its most basic level, what I have described has all the elements of a classic mismatch, with the universities producing a highly specialized product that the employers don't want. That clearly is not the case. Both academia and industry are still attracted to candidates with outstanding research credentials. And prospective employers still ask candidates to present research seminars describing their dissertation projects. But they are beginning to ask for more.

Increasingly, candidates for academic employment are being asked about their teaching experience and about their views on education, and some institutions (particularly liberal arts colleges or community colleges) may ask candidates to present a lecture rather than give a research seminar. Likewise, industrial employers may try to elicit a broader view of a candidates' research training, particularly as it relates to the interests of the company, than can be expressed by just examining the dissertation topic. These expectations of potential employers, coupled with constrictions in the traditional job market for Ph.D.s, translate rather quickly into student interest in a broader approach to graduate education. This has been encouraged by reports like *Reshaping the Graduate Education of Scientists and Engineers* (Committee on Science, Engineering, and Public Policy [COSEPUP], 1995), that recommend modifications, primarily in doctoral education in the sciences and engineering, that will give students this kind of preparation.

Students and graduate faculty members are broadening their definitions of goals and careers and trying to understand the role of graduate education in:

Preparation for research

Preparation for scholarship

Preparation for faculty positions

Preparation for industrial positions

Preparation for professional practice

Preparation for other positions

Preparation for life

My purpose here is to describe what is meant in each case, and then briefly to discuss a variety of approaches currently in place or being considered by universities in the United States and several other countries.

Preparation for Research

American graduate schools are very good at preparing students for research, clearly among the best, if not the best in the world. There is not always agreement about motives or context. Is the product the research result or the researcher? Are the graduate students there to help the faculty with their research, or is it the other way around? The answer, at least in the United States, is yes to all of the above. We have prided ourselves on the ability to produce research and researchers as part of the same process. To do that, we have developed a system that involves coursework coupled with doing research under the supervision of an established researcher. Until recently, this has been a uniquely American idea. Students truly are prepared to do research in their area of specialization. They are required to demonstrate that they know the literature and the techniques, and furthermore, that they understand how to solve problems in their fields. Several other countries are adopting or adapting this approach, and developing coursework components in what were formerly research-only programs.

But the research experience has to extend beyond mere technical training. This has been expressed most clearly by John Ziman (1968):

> To be a member of a team directed by a distant and very busy leader, building just one technical link in a complicated experiment, is an inadequate apprenticeship to the art; it is as if the pupils of Rubens were to be accounted artists after five years of painting-in the buttons on his larger compositions.... High technical standards may be achieved by the student, without a grasp of the deeper intellectual issues. (p. 91)

Similarly, Boyer (1990), has observed that, "Surely, scholarship means engaging in original research. But the work of the scholar also means stepping back from one's investigation, looking for connections, building bridges between theory and practice, and communicating one's knowledge effectively to students" (p. 16).

The point here is that graduate education must be more than a simple apprenticeship, and that research, in this context, must be more than a technical exercise for producing research results. It must be a vehicle for preparing scholars.

Preparation for Scholarship

Scientists often seem uncomfortable with the word scholarship, which usually is associated with the humanities and somehow doesn't seem as rigorous as research. There is relatively little use of the term in science programs, perhaps

because scientists may believe that the term "scientist" subsumes the term "scholar." Realistically, most Ph.D.s probably are what has been described as "operationally creative." That is, they have the kind of research training described above, and are very good at doing work and solving problems in their fields. Trying to make students more scholarly, more aware of the implications of their work and how it fits into a bigger and more complex pattern, is much more difficult than teaching them how to carry out a procedure and interpret the results. It usually is accomplished informally, through interactions with colleagues, through seminars, and, rarely, through specific actions. I have suggested elsewhere (LaPidus, 1996)[9] that research and scholarship may be related in much the same way as information and knowledge, and that if research is what you do, scholarship is the way you think about it. It is this broader view, this placing of one's research in a larger framework of intellectual work, not just in the context of the discipline, that distinguishes good graduate education from advanced training programs.

PREPARATION FOR JOBS AND CAREERS

In considering preparation for jobs or careers, the component usually left out in discussions of the topic is the responsibility of the employer. Many, if not most, employers understand that graduate education does not produce completely formed professionals ready to make a full contribution from the first day on the job. Good graduate programs produce people who are prepared to become faculty members or industrial researchers or practicing professionals in a host of fields. They have acquired knowledge and skills that make them well-suited for a variety of different positions, but they may need to be assisted in adapting to those positions. Possibilities exist for fruitful cooperation between the consumers and producers of recent graduates, and attention should be paid to the period comprising the last 2 years of graduate school and the first 2 years on the job. Regardless of the type of employment—academic, industrial, or other—the challenge is to make the transition smoother and more productive.

Preparation for Faculty Positions

Usually this is stated as preparation for teaching, but that is far too restricted a view of the faculty role. Faculty members do a lot more than teach. The new faculty member faces a daunting number of responsibilities. Those listed here represent the range of activities routinely carried out by faculty members at various times during their academic careers:

teaching advanced courses;

doing research;

getting financial support for research;

[9] The text of this earlier speech appears in this book as the article "Scholarship and Research: Gresham's Law Revisited."

writing and publishing articles in the scholarly literature;

directing graduate student research;

getting financial support for graduate students;

advising and mentoring graduate students;

teaching courses in professional programs;

teaching undergraduate courses;

writing textbooks;

advising and mentoring undergraduates;

participating in academic, administrative, and service responsibilities; and

bringing scholarship (that is, the ability to identify the important questions and suggest ways to find answers) to bear on all of the above.

Historically there has been little, if any, "preparation" for any of these activities except research. In fact, for the most part, they are not even discussed. Being a teaching assistant provides some exposure to teaching, but the TA experience is often confined to lower level courses, and in any case, has not usually been thought of in terms of faculty preparation. During the past 10 years, universities have been paying much more attention to the training of TAs, and a series of bi-annual conferences on TA training and responsibilities have attracted hundreds of faculty members, administrators, and graduate students. But being a teaching assistant is only part of the preparation for faculty roles.

As an approach to improving this situation, a number of universities have developed programs to introduce graduate students to the full range of faculty life. The Preparing Future Faculty (PFF) program, administered by the Council of Graduate Schools and the Association of American Colleges and Universities with funding from The Pew Charitable Trusts, is perhaps the most extensive of these. Fifteen clusters have been formed, each comprising a research university and a diverse group of institutions such as a comprehensive university, a 4-year liberal arts college, and a community college, all close enough geographically so that students can move easily among them. Doctoral students participate, on a discipline basis, in faculty activities in all four types of institutions. This program deals with the realities of being a faculty member in the variety of settings that constitute the academic job market. Variations of this kind of program exist at dozens of universities.

Preparation for Industrial Careers

Preparation for industrial careers has been much less structured than preparation for faculty careers and obviously applies primarily to the sciences and engineering. A number of institutions in collaboration with industrial partners have developed internships for doctoral and in some cases, postdoctoral candidates. In 1974, the Teaching Company Scheme was initiated in

Great Britain. This has mainly involved engineering students but has been expanding to include other fields. The term Teaching Company is analogous to Teaching Hospital, that is, a place where students can experience the research issues, as well as the culture, characteristic of a particular kind of setting. This may be a useful model to explore.

It is not unusual for science and engineering departments to develop industrial advisory groups. These involve researchers and research administrators from companies with interests in the research being carried out in the department, and in the students being trained. They may meet on a regular basis with faculty and graduate students to discuss mutual research interests and to cultivate graduate students who may be future employees. These advisory groups provide some exposure to industrial research problems, but little to industrial research culture. Combined with industrial internships, they may be of great value to graduate students interested in industrial careers. For example, the University of Wisconsin-Madison has developed a biotechnology training program that involves a 6-month industrial internship for graduate students.

During the past few years, there has been increasing interest in reshaping the master's degree in the sciences to serve as a useful credential, particularly for industrial employment. This has been quite successful in Japan (Normile, 1996) and has been urged in the United States in the COSEPUP (1995) report and also by Tobias and Chubin (1996). Along these lines, a master's degree in biotechnology was established in the mid 1990s at Northwestern University. This program is fundamentally different from a Ph.D. and is not preparation for that degree. Building on a core of courses in biotechnology, students from a variety of backgrounds (biology, engineering, chemistry, economics, and business) customize programs that may include business, engineering, and medical science components. The program is intended to prepare people for work in the biotechnology industry, and even at this early date it appears to be successful.

Preparation for Professional Practice

Preparation for professional practice usually refers to practice-oriented masters and doctoral programs in fields like business, education, engineering, psychology, and a host of other professional fields. Characteristically, the design of these programs is closely related to the current state of practice. Practitioners often serve as adjuncts to program faculty, and internships, residencies, and related professional experiences are the norm, either during, prior to, or immediately after completion of the graduate program.

Postbaccalaureate certificate programs, that is, nondegree programs consisting of courses or other experiences designed to provide students with certain specific kinds of skills related to current or prospective jobs, is a rapidly growing, but poorly defined area of graduate education. Certificates are offered by many

kinds of organizations, including universities, companies, and professional societies for varying time periods, and with different objectives. Sometimes these programs are designed to meet the needs of specific employers, or to satisfy continuing education requirements. Many deal primarily with professional updating and provide information and technical training. They may be ideally suited for programming in electronic formats such as the Internet, compressed TV, or video cassette courseware.

Postbaccalaureate education in the professional practice area, usually at the certificate or masters level, represents the most intense and extensive university interaction with the business, industrial, and professional communities. Many universities are paying increasing attention to this part of graduate education and are finding new and useful ways of meeting the educational needs of the public that supports them.

Preparation for Other Jobs

We know that people with graduate degrees find their way into a wide variety of jobs and careers, some by choice, some by chance, and some by default. The further away from their specific training, the greater the use of their general education, particularly the scholarly process. John Armstrong (1994), recently retired as vice president of science and technology at IBM, in a perceptive article titled, "Rethinking the Ph.D.," stated what I believe to be the essence of the issue:

> The training of new Ph.D.s is too narrow intellectually, too campus-centered, and too long. Furthermore, many new Ph.D.'s have much too narrow a set of personal and career expectations. Most do not know what it is they know that is of most value. They think that what they know is how to solve certain highly technical and specialized problems.... Of course, what they really know is how to formulate questions and partially answer them, starting from powerful and fundamental points of view. (p. 20)

The question then is—how do students discover "what they really know"? It may be that graduate educators have to become more explicit about it, rather than to hope it occurs by chance.

Preparation for Life

How far can or should graduate programs go in preparing students for life? Beyond ensuring that they know and can function competently in their fields, have some broader concept of scholarship that extends beyond those fields, and recognize the ethical responsibilities inherent in research and teaching, what else can graduate schools do that makes sense and helps students? The COSEPUP (1995) report and various other studies have made a number of reasonable suggestions, most of which come down to providing better information about jobs, careers, options, and safety nets. In some places, special seminars or

workshops have been organized to provide information on topics like preparing résumés, communication and presentation skills, time management, and working in teams. Former graduates may be brought back to describe their careers and give advice. The list could be endless. At some point, each program, through open and realistic discussions involving students, faculty, potential employers, and perhaps alumni, will have to develop ideas about what will provide the best graduate education.

APPROACHES TO CHANGE IN GRADUATE EDUCATION

Several qualitatively different approaches are being suggested for improving the education of graduate students. Brief descriptions of a number of these (collected as part of a response to the COSEPUP report, and all in science and engineering) appear on the website of the Association of Graduate Schools of the Association of American Universities <http://www-ags.ucsd.edu/ags.html>, and some will be used as examples in the following discussion. Generally speaking, these approaches fall into several well-defined categories:

- Universities are trying to provide better information about jobs and the job market. Given the uncertainties in predicting or projecting what the job market will be when current students graduate, they need to be made aware that there are no guarantees, and that their graduate education is applicable to a wide variety of career options. Career services and career development offices usually have been geared to the needs of undergraduate students. Brown, Cal Tech, Princeton, Michigan, and the University of Pennsylvania are among those that have developed specialized services of this type for graduate students.

- Seminars or workshops on the relationship of graduate education to particular fields, and on how graduate education relates to work, are being offered or developed at some universities. Among these are Emory, Rutgers, Ohio State, University of California at Berkeley, and Vanderbilt. Former graduates or other individuals involved in academic and nonacademic careers may talk about their careers and the role graduate education played in their lives. The University of Alabama at Birmingham has developed a workshop on career development for the life sciences that addresses both academic and nonacademic careers, as well as a monthly forum called The Industry Roundtable that brings in outside speakers to discuss nonacademic or unusual kinds of careers.

- The University of Manchester Institute of Science and Technology initiated the Graduate Support Programme (Grasp) in 1994. (Thompson, 1997). First year Ph.D. students are exposed to lectures on topics like project planning, time management, report writing, ethics, presentation skills,

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Develop programs similar to the M.Res. (Master of Research) degree recently initiated in the United Kingdom. Students from different disciplines are brought together to discuss and dissect research in a number of fields. The point is to illustrate the process of defining relevant questions and finding answers that are the basis for scholarly research in all fields. This kind of approach also emphasizes multidisciplinary aspects of problem solving. It is particularly useful for new graduate students. A modification of the M.Res. approach would be to have all graduate students participate in a research seminar that is multidisciplinary (not just in science and engineering, but including humanists and others). Real world problems would be discussed, and students might work in groups or react to speakers. The emphasis would be on scholarly approaches to evaluating evidence, posing questions, and suggesting ways to find answers. Along these lines, the University of Iowa has recently introduced a certificate program in The Rhetoric of Inquiry.

Any or all of these suggestions may be appropriate for individual programs, departments, or universities. They may be parts of other, quite different, approaches, such as the comprehensive changes recently initiated at Washington University (Magner, 1997). In this case, through the leadership of the Graduate School, the institution has decreased graduate enrollment (primarily to improve faculty-student ratios), provided assured multi-year support for graduate students, and instituted other changes designed to improve the entire process of graduate education.

CONCLUSION

All of these suggestions are reasonable. Some have been in place for years, some are now being considered, and some have recently been instituted. All suffer from the same drawback—they take time and increase the workload for students and faculty alike. Many people believe that these changes will increase the time it takes for students to earn their degrees. Actually, the most important variables related to that issue are probably adequate financial support, realistic dissertation requirements, and effective mentoring (Bowen & Rudenstine, 1992; Council of Graduate Schools, 1991). Compared to these, the program modifications suggested here will have relatively little effect on time to degree, and may lead to increased completion rates as well as improvement in the quality of graduate education and the career prospects of students.

Graduate schools have a unique role to play in facilitating the kinds of change discussed here. As has been pointed out repeatedly (Bowen and Rudenstine, 1992; Geiger, 1997), the departments are the dominant factors in graduate education, particularly at the doctoral level. So, for any change to be effective,

the program faculty must support it and be involved in it. But universities have to be more than collections of isolated departments. Graduate education transcends departments and disciplines because the assumptions upon which it is based have more to do with the level of education than with the particular subject area in question. The kinds of program modifications now being considered can be effective in improving the graduate educational experience of students and faculty, whether it be in chemistry or classics.

Unfortunately, it is all too easy for departments or programs to become isolated to the point where they are not aware of good ideas from elsewhere that could be adapted to their own use, and they are unable to share their good ideas with others. This is often true even within broad areas like the sciences or the humanities, and is almost always true across these disciplinary boundaries. Graduate schools serve to create the linkages, to open the system, and to focus the attention of the graduate faculty on the education of graduate students. Through discussion of the issues in graduate councils, institutional policies can be developed that facilitate actions at the department or program level, all within the context of a shared vision of good graduate education.

We have moved a long way from the one student, one professor, one research project concept of doctoral education. We are beginning to understand that graduate education should be designed to prepare students for a variety of roles and responsibilities. This does not involve simply adding on components. It requires examination of the basic purpose and goals of doctoral education. The COSEPUP (1995) report mentioned earlier, as well as several other recent books and papers (Tobias, Chubin, & Aylesworth, 1995; Conrad, Haworth, & Millar, 1993; Geiger, 1997; Haworth, 1996), and projects like Preparing Future Faculty, have pointed the way to a broader and more realistic view of graduate education, one that is consistent not only with the size and scope of the current enterprise, but with the state of education, work, society, and scholarship as we prepare to enter the 21st century.

Graduate students need to understand that today's job market doesn't tell us much about tomorrow, just as yesterday's didn't tell us much about today. Students should keep their eyes and ears, their minds, and their options open. The best advice for faculty members is this:

> To help students prepare for a variety of possible careers, don't train them too specifically for any one. Instead, provide the kind of education that enables them to know their fields, understand the processes of scholarly inquiry, and have a realistic picture of how they can use these incredibly valuable skills in a variety of ways, in a variety of settings, and in a variety of satisfying and rewarding careers.

IF WE WANT THINGS TO STAY AS THEY ARE, *then things will have to change*

Recently, I carried out a project in asynchronous, distance learning, utilizing perhaps the most powerful technological advance in the history of education. What I did, actually, was read a book. It was a book written some 50 years ago, and it was set in Italy about 100 years earlier than that. The author died just after the book was completed. I read parts of it in bed at night, parts while on airplanes, parts on trains, and parts early on weekend mornings. If that's not asynchronous and distant, I don't know what is. We all should be grateful for that marvelous invention, the printing press, that has made experiences like this possible.

This paper was adapted from talks given at the Sixth National Conference on the Education and Employment of Teaching Assistants and the AAUP Conference on the Growing Use of Part-time/Adjunct Faculty, both in 1997.

The book was *The Leopard,* written by Giuseppi di Lampedusa and published in 1960. Lampedusa was the descendant of a noble family from Sicily. The major character is the Prince, a powerful and thoughtful man, growing old in a rapidly changing world. It is 1860, and the end of the Bourbon state of Naples and Sicily (the Kingdom of the Two Sicilies), is imminent. Garibaldi has gathered an army that will conquer the island. Italy will be unified, and the world the Prince knows will be changed forever. He will do nothing about it. Although he doesn't care much for the coming government and has no particular feeling for the old monarchy (except a residual loyalty to the crown), he really is not capable of changing. As he says, "I belong to an unfortunate generation, swung between the old world and the new, and I find myself ill at ease in both" (Lampedusa, 1960, p. 209). He would prefer to live out his remaining years in dignity, and for things to stay relatively unchanged, or at least to change slowly.

In a famous scene, the Prince's young nephew, Tancredi, who knows the world is changing and intends to be part of it, announces that he is going up into the mountains to fight with the rebels. When the Prince expresses surprise at this unusual action, Tancredi, in what is probably the book's best known line, replies, "If we want things to stay as they are, then things will have to change" (Lampedusa, 1960, p. 40). When I read that line, I thought it would be a terrific title for a talk,

since it captured the mood of many current discussions about the future of universities, and more particularly, about graduate education, particularly now, when so many feel caught in a period of rapid and massive change.

The more I thought about it, however, the more concerned I got. There seems to be a lot of dissatisfaction with things as they are. For the purposes of this talk, perhaps a more appropriate title would be, "If We Want Things to Stay as They Were, Then Things Will Have to Change." But "the way they were" is different for everyone and depends a lot on selective memory loss, especially as we get older. The Golden Age, viewed through the misty lens of nostalgia, always looks pretty good. My pure faculty career (before I became a dean) spanned the period from 1958 to 1972. Many people believe that was perhaps the most atypical period we have known in higher education in America, at least in this century. Everything was expanding, grants were easy to get, and tenure track faculty positions were abundantly available. That ended in the early '70s, and my happy cohort and I found it difficult to accept that what we had assumed was the way it was—the reference state, the norm—wasn't.

Another approach to a title would be, "If We Want Things to Change, We Can't Stay the Same." That sounds like it might work, but it finally forces me to define a few terms. First of all, what do I mean by "things"? I think that refers to the nature of higher education, particularly the way universities define and carry out their functions, and to the role that universities play in people's lives and in society. During the last 50 years we have seen many changes. Certainly there have been economic and political changes, and we have seen periods of expansion and contraction. There have been societal changes, and new kinds of students began coming to the university, starting with the veterans who appeared after World War II and moving through the Civil Rights era that began to change the demographic profile of students and faculty. At the graduate level, the past 20 years have witnessed a dramatic increase in the diversity of the population of women, minority, international, part-time, and older students.

But through all that time, people have continued to come to the university, pretty much as they always have done, to enroll in graduate programs, take courses, attend seminars, do research, and eventually get degrees that have been perceived as having a certain value with respect to jobs and career expectations. All of that now appears to be changing, and those changes are modifying the way we define faculty as well as students—what they do, how they do it, where they do it, when they do it, why they do it, and who they are. But beyond that there seem to be fundamental changes taking place in what we define as education and in how the acquisition of educational credentials relates to the way people live and work.

That brings me to the other term that requires definition. What do I mean by "we"? For the most part, I use "we" to mean those who are professionally involved in higher education. "We" is probably the faculty, academic

administrators, and, to a large extent, graduate students, all of whom are involved in carrying out the work of the university. But everybody wears several hats. Graduate students teach and learn and do research. So do faculty. We are simultaneously the purveyors and the consumers of that commodity called "the higher learning."

We are the students, the teachers, the teachers of teachers, the scholars, and the parents, spouses, family, and friends of students and teachers alike. In this context, the collective "we" can be used to refer to those of us deeply involved in graduate education.

"We" probably is not the taxpaying or tuition paying public or their elected representatives. It certainly isn't the nonuniversity, for-profit sector that sees a market in providing educational services. "We" are concerned with what happens to us. "They" are primarily concerned with providing education to the consumer regardless of who does it and regardless of where and how it is done.

Perhaps the most realistic title would be "Things are Changing, and If We Want to Stay the Same, We'll Have to Change Too." That is a very different concept because it acknowledges the fact that things are changing regardless of whether we want them to or not. Our problem is what to do about it.

Let me restate my original title: "Higher Education Is Changing, and If Faculty Members Want to Continue to Play a Major Role in Its Future, They Will Have to Change Too." This is a very sensitive issue. A couple of years ago, I gave a talk about distance education and technology to a faculty group and got almost no reaction from the audience. While discussing this experience with the person who had invited me to speak, I was somewhat surprised when she said that I had scared the audience to death; they had interpreted my talk as telling them that they were going to lose their jobs. Many were afraid of the new technologies, but they were most afraid that the administration of their university, in an excess of technomaniacal zeal, would have visions of a single, probably part-time faculty member teaching thousands of students, with no outlay for new space.

As I read the education and popular press, I find general agreement that higher education is changing rapidly. Much of the talk is about technology, about whether it's a good idea, for example, for faculty members to prepare a web page for each course, about different kinds of universities like Walden, and the University of Phoenix, and the Western Governors University, about "just in time, any time" learning. Distance education is not a new phenomenon, nor is asynchronous learning. Both were made possible by the invention of the printing press. People have been learning from books, independently, on their own time, and in places they chose, for hundreds of years. Correspondence courses have occupied a regular, if somewhat suspect, place in education, and replacing written materials with video cassettes does not really represent a conceptual revolution.

When I was a faculty member, distance education usually meant getting in your car after work and driving to a local high school or community center to

meet a class of adults who were working on a master's degree. Today we may ride on the Internet instead of the Interstate. We've come a long way since then, particularly in terms of the technology, but the concept is more or less the same. People need to learn at various times during their lives. It's not always possible or convenient for them to come to the university, so we have developed ways for the university to come to them. What is critically important and serves to drive much of the development we see today, is that it is not enough to study on your own. People need certification, in some form acceptable in the marketplace, of their educational achievement.

Much of the experimentation and development of programs using distance education and technology have been at the masters and certificate levels and have proven to be successful in meeting the continuing educational needs of many people, particularly working professionals. Interest in this area is high and offers the potential for expansion to many, if not all, areas of higher education.

Getting a baccalaureate degree at age 22 or, for that matter, at any age, may not do much in terms of either keeping you current or proving to potential employers that you are. You might consider getting a master's degree a few years after the baccalaureate, but these days, by the time you finished, the material probably would be obsolete, and so would you. Well, there's always the Ph.D. That's supposed to last forever and prepare you for whatever comes your way, because it gives you a way to think about things. But a lot of recent commentary seems to indicate that Ph.D.s are so narrowly trained, that anything very far from their dissertation research is quite a stretch. The answer is fairly obvious. Acquire the competencies you need through intermittent, highly focused, short-term educational experiences that provide certification of abilities.

Donald Langenberg (1997), chancellor of the University System of Maryland, in an article, "Degrees and Diplomas are Obsolescent," made a compelling case that education is a lifelong business, not to be acquired in large and occasional chunks, but in smaller doses whose purpose is to continually develop your ability to cope with the demands of a rapidly changing world. "Learning," he stated, "will occur wherever students can connect to the World-Wide Web" (p. A64). Students will accumulate "certificates of achievement" at various times during their lives, and perhaps replace formal degrees with portfolios or personal web pages. He may be right or he may be wrong, but his vision forces us to come to grips with a basic fact of our times. This is no longer just the post-Gutenberg university, it's the "post-Internet" university, and that makes a difference—for education, for how people learn, and for what faculty and students do and how and where they do it. Things will not stay the same, regardless of what we want, or whether or not we change.

In some fields, complete masters and doctoral programs are available online, or asynchronously, often polarizing the academic community over issues related

to quality and substance. As is usually the case in debates like these, there is a tendency to make comparisons between the most exemplary practices of traditional programs and the most egregious excesses of nontraditional programs. For some faculty members, the idea of using different, virtual approaches to education, particularly graduate education, is anathema. They see proposals to utilize technology, especially the Internet, to deliver all or part of graduate programs, as being incompatible with their view of credible scholarship. Some will concede that it may be possible to do certain rather simple things using online educational methods, but that it clearly is impossible to do real graduate education that way. In a sense they are like the Prince, members of the old nobility, caught in between two worlds, uncomfortable in either, but unwilling or unable to change. In contrast, many other faculty members have "joined the rebels," and are leading the charge. Entire conferences are being devoted to the exploration of new techniques and new philosophies.

In thinking about all this recent commentary related to change, I realized that I had seen very little about what we wanted to stay the same. That caused me to wonder whether there were generally held values concerning higher education that we want to keep regardless of how, where, or in what form they are kept, and whether we were sufficiently committed to the preservation of these values.

As education changes in qualitative ways, the question arises as to whose business this is. Until now, it has been, for the most part, the business of universities and their faculties—designing curricula and programs, helping students learn, and certifying educational accomplishment. This has been done as part of a system whose mission was not just to disseminate knowledge, but to play a direct role in its discovery. Furthermore, the confluence of those two activities represents the ideal, achieved more often than not, of the American university. Those are the things we would like to stay as they are.

That system is under considerable strain, not just financially and politically, but because many people have become pessimistic about the ability of the university to live up to its promise. Even though there is a consistent and direct relationship between educational level and employment, when jobs are harder to find, the investment in education becomes harder to justify. There has been much disillusionment about the future of academic employment, among both those seeking it and those holding it.

Of particular interest to me was an article published in *Science* about 2 years ago. The title was "Electronics and the Dim Future of Universities" by Eli Noam (1995). He pointed out that the teaching function of universities is often thought of as the transmission of information, and that there has been "a reversal in the historic direction of information flow." He went on, "In the past, people came to the information, which was stored at the university. In the future, the information will come to the people, wherever they are.... Will the

impact of electronics on the university be like that of printing on the medieval cathedral, ending its central role in information transfer" (p. 249)? It surely will be if we believe that what universities are for is to gather, store, retrieve, and disseminate information. There are too many other ways to do it, probably faster, better, and maybe cheaper.

Some years ago, in a speech entitled *Gresham's Law: Knowledge or Information?* Daniel Boorstin (1980), then Librarian of Congress, commented about our fascination with the information industry, and our relative neglect of what he called "the knowledge industry," that is, colleges and universities, libraries, and museums. He referred to "our ironic twentieth-century version of Gresham's law [by which] information tends to drive knowledge out of circulation" (p. 3). The latest information on anything and everything is collected, diffused, received, stored, and retrieved before anyone can discover whether the facts have meaning." That sounds like a fair description of the World Wide Web. Boorstin suggested that, "Information, like entertainment, is something someone else provides us. We expect to be entertained & also to be informed. *But we cannot be knowledged!* We must all acquire knowledge for ourselves" (p. 6).

I found Boorstin's image compelling, and casting about for other related views, I came across several commentaries that seemed relevant. Burton Clark (1993) discussed Wilhelm von Humboldt's model of the university as one where "the subject, not the student, is at the center" (p. 3). Clark, quoting Humboldt, wrote, "The relationship between teacher and student . . . is changing. The former does not exist for the sake of the latter. They are both at the university for the sake of science and scholarship" (p. 8).

Jaroslav Pelikan (1992) suggested that there are several activities that define the university, and that they include:

> advancement of knowledge through research; extension of knowledge through undergraduate and graduate teaching; training that involves both knowledge and professional skill in the professional programs or schools of the university; preservation of knowledge in libraries, galleries, and museums; and diffusion of knowledge through scholarly publication (p. 76).

Robert Rosenzweig (1982) approached it somewhat differently when he wrote, "A research university is one whose mores and practices make it clear that enlarging and disseminating knowledge are equally important activities and that each is done better when both are done in the same place by the same people." (p. 1)

The common thread running through all of this, of course, is knowledge, knowledge as the defining characteristic of universities, and, in fact, of higher education. And as Boorstin has pointed out, you can't knowledge someone. There is an integrating, synthesizing process that has to take place in someone's

head, and the educational process has to provide a means to that end. There may be many ways to do that, but it has to happen.

Universities have done a pretty good job of convincing the public and the patrons of higher education that we can subdivide what we do into smaller and ever more specialized portions, and that by putting these together in various combinations, people can become educated. Some can. Most can't, at least not without some guidance in making the connections and seeing the relationships. Accumulating courses is fine, but the program, if there is one, exists in the spaces between the courses, and is not always so easy to find by yourself. Connectivity, then, is another important attribute of universities. The term has been virtually taken over (no pun intended) by the techies to mean access to the Internet, but I am using it in a much broader sense to refer to the connections involving people and ideas that we associate with higher learning.

Another indispensable component of what we want to stay the same is intellectual collegiality. In a discussion of the role of graduate school as preparation for faculty careers Robert Voelkel (1986) concluded that perhaps the master-apprentice metaphor was incorrect, and that preparation for teaching was not a question of a master training apprentices in the art and skills of teaching, but of men and women of learning sharing an intellectual quest with their students. He suggested that this intellectual collegiality was the major contribution that graduate education makes to the preparation of faculty. I would go further and say that intellectual collegiality is another value of universities that must be preserved.

Let me return to my quest for the perfect title. What I hope has emerged from my remarks is a little long, but here it is: "If We Believe that Some Things Must Stay as They Are (Things Like Intellectual Collegiality, the Pursuit of Knowledge Rather Than the Acquisition of Information, and Connecting People and Ideas), Regardless of What Happens to the Physical University as We Have Known It, Then We May Have to Change to Preserve the Idea of the University."

The last few lines of the previous paragraph provide a segue to two of my favorite quotes about faculty and universities. The first was written in 1852 by John Henry Cardinal Newman, about the time of all that fuss in Italy that I started out with:

> [T]here will be this distinction as regards a Professor of Law, or of Medicine, or of Geology, or of Political Economy, in a University and out of it, that out of a University he is in danger of being absorbed and narrowed by his pursuit, and of giving Lectures which are the Lectures of nothing more than a lawyer, physician, geologist, or political economist; whereas in a University he will just know where he and his science stand, he has come to it, as it were, from a height, he has taken a survey of all knowledge, he is kept from extravagance by the very rivalry of other studies, he has gained from them a special illumination and largeness of

> mind and freedom and self-possession, and he treats his own in consequence with a philosophy and a resource, which belongs not to the study itself, but to his liberal education. (Newman, 1947, p. 147)

Newman presented an image of a faculty as being something more than the sum of its parts and made it clear that for that to happen the members of that faculty must have a broader context for understanding what they know and teach than can be defined by the limits of their individual disciplines. He also clearly implied that they must interact with each other. In other words, intellectual collegiality among the faculty is a defining condition for a university.

I'm reminded of my own involvement as a member of the small faculty of a professional college, each of us hired on the basis of our very different research interests, but all of us continually preoccupied with how those interests and our individual disciplines fit together to form the curriculum for our professional students. I also remember a line from *Integrity in the College Curriculum*, a study published in 1985 by the Association of American Colleges, that expressed concern that the faculty was not taking corporate responsibility for the curriculum, that is, not being involved beyond the level of their own disciplines. It's too easy to say that the main difference between part-time and full-time faculty is that the part-time faculty isn't there all the time. The problem is that in many cases, neither is the full-time faculty. As if that weren't bad enough, our concept of what we mean by "there" is changing rapidly.

The other quotation is from the article by Eli Noam (1995) mentioned before:

> True teaching and learning are about more than information and its transmission. Education is based on mentoring, internalization, identification, role modeling, guidance, socialization, interaction, and group activity. In these processes, physical proximity plays an important role. Thus, the strength of the future physical university lies less in pure information and more in college as a community; less in wholesale lecture, and more in individual tutorial; less in Cyber-U, and more in Goodbye-Mr. Chips College. (p. 249)

Noam was talking about education as a labor-intensive, interactive process through which people are not just informed, but can become knowledgeable. Now, we all know examples of wonderful scholars who were self-taught and went on to do great things. The reason we know about them is that their education was so unusual that they or others wrote books about it. What is much more usual is for former students to remember certain faculty members who opened their minds, extended their vision, and changed their lives. That is most likely to be true for those who went on to become faculty members, at least in part because of the influence of those kinds of people. Each of us remembers our own Ms. or Mr. Chips. And . . . is it possible? He or she might

even have been a part-time or adjunct faculty member. Could it be that a part-time faculty member could have played the mentoring role effectively?

I hope that these two statements—separated in time by over 140 years—taken together with some of my comments about what I believe must stay the same and what can change, will be useful as "we" discuss the implications of the growing use of part-time and adjunct faculty.

For me, the important question is this: How will a changing concept of what we mean by higher education affect our ability to retain and expand our ideas of what we mean by faculty? We must find acceptable answers to that question, or we may end up preserving a concept of faculty that has no relationship either to the education of students or to the role of higher education in society.

Things have changed. We may have to change with them.

THE ROLE OF THESES AND DISSERTATIONS

as independent works of scholarship

Theses and dissertations are the technical terms for documents written to describe the results of scholarly investigations done in connection with graduate degrees. In the United States, the term dissertation tends to be used in doctoral education and thesis for masters education, although some use thesis for both. The situation is further complicated by the fact that in addition to being a document, a thesis can also be a proposition, or statement of problem, as in "What is the thesis of your dissertation?" In addition many countries other than the U. S. use the term thesis for the document describing doctoral research. In this paper, thesis will mean masters thesis, and dissertation will mean doctoral dissertation.

This paper was a part of a seminar on "Scholarship in the Electronic World" at Virginia Polytechnic and State University in March 1998.

Generally speaking, all doctoral programs require students to submit a dissertation in partial fulfillment of the requirements for the Ph.D. degree. Many years ago, a parallel situation obtained for the masters thesis. It was commonly held that doing a masters thesis was necessary (or at least desirable) preparation for the doctoral dissertation. In the process, the student was expected to do research and to write a description of the project and its outcome. The dramatic increase in practice-oriented masters programs (that is, programs not intended to lead to a further degree, like the M.B.A., M.S.W., and M.P.A.) that began in the 1960s, plus the relatively minor role played by masters programs in many departments that grant the Ph.D. (Conrad, Haworth, & Millar, 1993) have changed that to the point where the majority of master's degrees no longer have this kind of requirement. What has been common practice for years is for departments to make available both thesis and nonthesis options for masters programs within general guidelines developed by graduate schools.

There are no reliable data available on what percent of master's degrees involve theses, and no way to tell by degree titles or disciplines. In some cases, often in technical disciplines like engineering, it is common practice for departments to require that all students do a thesis. In others, it is up to the student. Masters diplomas carry no indication of whether the degree is thesis or nonthesis. Further, the extraordinary flexibility afforded departments in defining what

constitutes an acceptable masters thesis leads to a wide variation in concept and contents. Some theses are designed as technical exercises intended to help students develop skills. These may involve replicating the work of others or collecting and analyzing data on projects defined by the advisor. In other cases, the thesis may represent a kind of mini-dissertation on a project more limited in scope than a dissertation. For the most part, theses are not expected to demonstrate the student's ability to do original, independent scholarly research of a quality acceptable for publication in the scholarly literature.

In practice-oriented masters programs, thesis topics tend to deal primarily with the state of professional practice. Many of these will be largely descriptive in nature and may be relatively local in scope, that is, they may be focused on a local industry or organization (e.g., a school system). In some technical areas like engineering, the topic may be a particular process or technique. In these and similar situations, the thesis itself may be used by the parties directly involved, that is, the practitioners. The material may not actually be published, yet have a life of its own as a useful reference.

The doctoral dissertation represents an entirely different situation. In 1991 the Council of Graduate Schools, an organization of some 420 institutions that grant approximately 98% of the doctoral degrees awarded in the United States, published the results of a study titled *The Role and Nature of the Doctoral Dissertation.* Briefly, the study involved 50 universities, all of whom were asked to respond to a survey about dissertations using whatever campuswide group the institution usually convened to consider broad questions related to graduate education. In most cases this was a graduate council; in some, ad hoc committees were appointed.

The questions were very broad:

> Is there a consensus across disciplines about the distinguishing characteristics of doctoral research? Of the doctoral dissertation? If there is, what is it? If there is not, what are the points of disagreement?
>
> Are students allowed to use work done in collaboration with others as all or part of the dissertation?
>
> Can a student's previously published work be included in the dissertation?

We also asked that the respondents consider what the ubiquitous adjectives "substantial," "significant," "original," and "independent," really meant in describing doctoral research and dissertations. Someone even revived the old story of the external examiner who claimed to find a dissertation both significant and original, but noted that "unfortunately, the part that is significant is not original, and the part that is original is not significant."

I do not intend to describe the study in detail, but several points are directly relevant to the topic of this paper. There was some skepticism at first about trying to define the dissertation in a discipline-free way. Some people doubted that they could have productive discussions about the concept of the dissertation across fields as different, for example, as chemistry and classics. As it turned out, there was agreement across all fields that the dissertation served two purposes: to allow students to demonstrate that they could do whatever people in that field did when they did research and to produce research that constituted a (significant? original?) contribution to knowledge. These two very different skills are generally considered as being necessary conditions for the award of the Ph.D. in most countries and educational systems.

A particularly enlightening discussion occurred at a meeting of graduate deans where we were discussing the CGS dissertation study. One of the deans rose to his feet, identified himself as a chemist, and said that he saw no use in the traditional solo dissertation where the student takes a problem from beginning to end, dealing with the historical background, the literature review, the analysis of various approaches, and then writes up the entire story. He said that nobody did research that way in the real world. Scientists worked in teams and published their work as it was done, in the form of short papers. He concluded that since the student probably would never again do the comprehensive kind of project usually represented by the classical dissertation, there was no reason to do it while a graduate student.

After a short pause, another graduate dean rose to his feet, mentioned that he too was a chemist, and agreed that it probably was true that there was not much chance to be involved in that kind of total approach to research after graduate school. That led him to conclude, however, that there was all the reason in the world to do it while a graduate student, since he felt that scientists ought to have the opportunity to do that kind of research project at least once.

This story captures some of the ambivalence connected with the dissertation. One point of view is that it is tangible evidence that the student is prepared to do scholarly research. If this is interpreted too strictly, that is, in terms of demonstrating technical expertise only, the significance of the topic as a contribution to scholarship may not be an important consideration. Another concept of the dissertation is that it demonstrates that the student can do scholarly research, in which case an exquisitely executed study on a topic deemed to be trivial would not be acceptable. Some believe that the dissertation is a beginning work, others that it is perhaps the student's major scholarly accomplishment.

The terms original and independent (meaning that the research idea, the design and execution of the project, the analysis of results, and the conclusions are the student's own work) have been reinterpreted in many fields where it has become common practice for students to be assigned projects by their advisors

and to work in teams. In conversations several years ago with colleagues in England, I mentioned that one of the findings in the CGS dissertation study was that the advisor can make a major contribution to decreasing time to degree and increasing completion rates by helping students "select manageable topics and to discourage them from undertaking that which is too broad in scope to complete in a reasonable and timely fashion" (Council of Graduate Schools, 1991, p. 4). My British colleagues were surprised because they felt that if that were the case, the project would no longer represent the student's own work.

Field differences can be extremely important in influencing the concept of the dissertation. Dissertations in the sciences may actually be collections of papers that have been published in the scientific literature, or shortly will be. In the humanities, on the other hand, prior publication of part of a student's dissertation work would be viewed by many faculty as precluding its use as part of a dissertation on the grounds that if it has been published, it is no longer original.

Dissertations done as part of a team effort, or as part of a long term research interest of a faculty member that involves several or many students over a period of time, may serve as useful references to other members of the group. For example, the dissertations of former students will be an invaluable resource, in terms of background, bibliography, techniques and experimental procedures, and lessons learned, to current students working in the same area. Here again, they are local resources, used in their original form, or as copies held by the advisor.

An important issue related to the dissertation has to do with the question of publishability. At one time, many graduate schools required that the dissertation, or a report derived from it, be accepted for publication before the degree was awarded. That is no longer the case, although in many science fields, as mentioned earlier, it is common practice for the substance of the dissertation to be published in the form of short journal articles before completion of the dissertation. In fact, some institutions permit students to bind together articles that have been published, provide bridging material to make the document coherent, and submit the product as a dissertation.

In practice, the dissertation is often regarded as a proto-document that can be scaled up or down to produce a book or disassembled and modified to produce a series of short articles or papers. What is most likely to be the case is that the dissertation will not be published at all, but will exist as a kind of archival reference, accessible through various search processes, primarily Dissertation Abstracts, or on university library shelves.

Recently, I had occasion to visit a very large reading room in a major university. It was very quiet, and afternoon sunlight slanting through the high windows created a warm and sleepy atmosphere. The room was richly paneled in some dark wood. There were many reading tables, and the walls were lined with shelves holding uniformly bound volumes of dissertations and theses that had been written at that university over the years. There was no librarian

present, but there was a sign on the wall indicating that the documents were arranged alphabetically by author and could be checked out. Two people were seated at widely separated tables, reading, studying, and perhaps dozing a little. I randomly took some dissertations and theses off the shelf. They had library checkout slips inside the front covers. One had been stamped out once, the others not at all. This is stereotypical picture of the final disposition of the dissertation—something like the graveyard of the elephants.

The prospect of finding the legendary graveyard of the elephants was a powerful stimulus to those seeking to make a fortune from the ivory they would find there. An modern approach is the recently announced Innovation Grants Competition by the Merrill Lynch Forum that is intended to find commercially usable ideas that may be hidden in dissertations. This competition encourages new Ph.D.s to explore the "marketplace potential" of their dissertation ideas. In addition to cash awards, winners will meet with leading entrepreneurs and venture capitalists to discuss their work.

Along the lines of the publication of dissertations as books, Madsen (1983) commented that there are some 31,000 dissertations written in the United States each year, making it both impossible and impractical to attempt to put them all into the hands of the reading public. Today, in 1998, the United States produces close to 44,000 dissertations each year. There is no way to tell how many masters theses are written each year, for reasons mentioned earlier. In 1997, University Microfilms published about 5,000 from Canada, and about the same number from the U. S. and other countries combined (W. Savage, personal communication, March 30, 1998). Canada is mentioned because the source of these documents is the National Library of Canada's Canadian Thesis Program, which claims to be comprehensive in its coverage. Since the number of master's degrees awarded in Canada in 1996-97 averaged 21,000 to 22,000, about one quarter of them were thesis programs. If the same proportion held true for the United States (and there are reasons to believe it would be less), we would be producing approximately 100,000 theses from the 400,000 master's degrees awarded each year. A more reasonable estimate might be that in addition to some 44,000 dissertations, another 60,000 or so theses (15%) might be produced each year. Thus, some 100,000 documents reporting the work done for advanced degrees would be produced annually.

In considering this mass of information resulting from thousands of research studies, Madsen, (1983) stated the issue quite well:

> Everyone who has ever written a dissertation hopes his manuscript will serve as a useful resource for other scholars in years to come. Gratifying as it is to see one's work cited occasionally in a footnote or bibliography, many authors would be delighted to see their dissertations reach a larger audience. Must those neatly typed,

> handsomely bound manuscripts be left to gather dust on library shelves? Or is there life for the dissertation after the defense? (p. 92)

This gives rise to a number of questions. Is there a reason to keep dissertations as bound, paper and ink books after the defense? Probably not. Is there a reason (aside from the need to demonstrate that it has been completed and successfully defended) to retain the coherence of the dissertation in some form? That is more difficult to answer. Clearly, it is a record of what has been done, and at the very least, provides a resource for those studying the nature of graduate education. But if, for example, a series of papers or a book have been written, deleting the parts of the dissertation that deal with false starts, failed experiments, extensive review of the literature, and the other components that characterize dissertations, is there still need to retain the integrity of the dissertation as a type of document? Maybe . . . particularly for people interested in extending the work. Is there intellectual life for the substance of the dissertation after the defense? In some cases yes, in others, no. The trouble is, it may be difficult to make that judgment until years after the work has been done.

Does the dissertation or thesis have its own integrity as a scholarly work, apart from articles or books that may be derived from it and separate from its documenting function in a graduate program? This most important question is difficult to answer in any but anecdotal terms. Some things are obvious. In areas like engineering and the sciences dissertations are likely to contain technical information such as experimental procedures and specifics of equipment design and construction. To the extent that this material has not already been published in the form of articles in the scientific literature, some might seek out the dissertation to get details on procedures of interest to them. Savage (personal communication, March 30, 1998) indicated that the demand curve for science and engineering dissertations drops precipitously in the first 6 months and is about zero after 1 year. In the humanities, particularly fields like history, music, art history, and classics, demand curves may level off and continue for many years.

Savage also stated that the Library of Congress receives a minimum of 70 onsite requests per day for dissertation microfiche and that UMI receives an average of 1,000 interlibrary loan requests per month, which he believed would constitute only about one tenth of the interlibrary loan request traffic. Large numbers of dissertations are sold to libraries in Europe and Asia interested in providing support materials for developing graduate programs.

In considering the life of the dissertation, it may be useful to list the kinds of documents we use to communicate the results of scholarly work (keeping in mind that the "electronic world" is changing all of this as we speak). Ziman (1968) reminded us that science is public knowledge, by which he meant that the state of knowledge in a discipline represents a consensus that can only form if one's ideas, hypotheses, evidence, and proof are freely available for others to evaluate, disprove, defend, or extend. How do we do this? There are

conferences at which scholars present the results of their work. Often, these conferences provide published proceedings or abstracts of papers presented.

In some fields, letters to the editor of a scholarly journal are a form in which to succinctly present an idea for public scrutiny. The communication is a useful, often relatively fast way of publishing an important new finding. Papers in journals are the common currency of scientific communication. Review articles bring together the literature on a given topic. Beyond this we have the treatise, the monograph, and the book, all more developed, more complete expositions of a given topic. In almost all cases, these examples of formal scholarly communication involve some kind of peer review prior to acceptance for publication.

Somewhere among all of these kinds of documents floats the thesis and the dissertation, usually subject to review only by a local reading committee. Ziman (1968) commented on the lack of external examiners on dissertation defenses in the United States, in contrast to their "universal and compulsory" use in Britain:

> The standard of a Ph.D. is therefore the standard of the University that awards it, not some general standard recognized by the whole scientific community. It is not surprising that many American Ph.D. theses do not really attain the level of being publishable as scientific papers in reputable journals and that their expository style is often so poor. (p. 90)

Sullivan (1997), in a recent presentation about issues affecting the future of the specialized scholarly monograph (many of which are published by university presses), broadened this point to include electronic publication:

> The Internet is the ultimate vanity press.... University presses need to communicate the value-added by their peer review and editorial processes. Just as we rely on scientific journals to separate real science from junk science, so our presses should help us distinguish between real scholarship and junk scholarship. This does not limit the presses to paper only; their Web sites could be peer-reviewed. (p. 1)

For the most part, dissertations and theses are not written for publication but to satisfy requirements for a degree. In that sense, they are retrospective, not only in content but in intent. Their primary purpose is to document what the student has done, and not necessarily to contribute to the constantly changing consensus that points the way to what needs to be done next. To be publishable, they need to be adapted, refined, and tailored to meet the constraints, standards, and expectations of the scholarly community. Usually, this is not simply a matter of style. Draconian pruning and judicious grafting are almost always required to convert a dissertation or thesis into a publishable document. Why then, is there a consistent interest in access to dissertations and theses? I believe there are several reasons, among them:

- A large proportion, perhaps an overwhelming majority of dissertations and theses are never published in any form. They are the only sources available for some information, particularly in fields where the monograph is the usual form of publication, the costs of publication high, and the market relatively small.
- Dissertations and theses are of interest to those studying the history or nature of a discipline or a department. They provide a longitudinal record of the scholarly interests of the faculty and students, either on a local or a discipline basis. In the broadest sense, they provide a picture of how the preparation of scholars relates to the evolving intellectual development of a field.
- Scholars working in a particular field are interested in keeping as current as possible with respect to what others are doing. Generally speaking, the dissertation or thesis is available more rapidly than the commercially published paper or book, and is likely to contain much more detailed information, with respect to both substance and background (e.g., literature review) than the published document.

The way we think about theses and dissertations, particularly in terms of their use as works of scholarship, is changing as a result of major technical and conceptual advances in the way we deal with information. Not only can we do things faster than we could before, but the electronic age enables us to do different things; theses and dissertations will increasingly become multi-media presentations. The questions we must ask, however, are still the same as they are when contemplating any major change:

How can we provide access to the information we need?

How can we ensure the reliability of that information?

How much will it cost?

How will it improve our ability to do scholarly work?

How will it improve graduate education?

Is it worth it?

Do we have a choice?

It seems clear to me that some theses and dissertations do exist as independent scholarly resources. Some may be converted, through publication, into more useful sources of information. Others disappear, sometimes forever, because they do not survive the intense scrutiny of peers or because they are of no particular interest. Some are rediscovered years later, when someone with a keen eye and a broad view recognizes their value. The physical forms in which they exist are immaterial, in every sense of that word. Their future as a means of scholarly communication depends on how we choose to define and use them.

SOME GLOBALIZATION

aspects of graduate education

Several years ago Donald Cram (1989) Nobel laureate and professor of chemistry at UCLA, gave a talk about his concept of being a major professor. In that talk he stated that he believed that all of his over 200 doctoral graduates were what he called "operationally creative," that is, they could solve problems in chemistry. He went on to say that between 5% and 10% of these students were "conceptually creative." That is, they could decide what problems needed to be addressed.

This talk was delivered at a meeting of the National Science Foundation in March 1998 and also at a meeting of the Conference of Southern Graduate Schools.

There seems to be relatively little difference among countries in their ability to produce conceptually creative people. One could argue that particular creative abilities may be innate, that the ability to "look at what others have looked at and see what no one else has seen before" is not confined by national boundaries.

But the United States has excelled in producing operationally creative Ph.D.s in amazingly high numbers compared to any other country. That may be the true genius of American doctoral education. It certainly is the reason that many countries around the world are using U. S. doctoral education as a model when considering changes in their own systems of graduate education.

As Blume (1995) pointed out, "The attractiveness of the North American model has derived from the fact that it has seemed able to ensure effective and efficient training of researchers on a much greater scale than has been usual in European universities" (p. 23).

Historically, research has been the characterizing element of doctoral education. Whatever else was done, research was always the centerpiece. In fact in most countries it was the only piece. Doctoral students in Ireland had to complete "a substantial thesis making a significant original contribution to knowledge" (Kouptsov, 1994, p. 118).

This was the only requirement for the degree, and much the same held for almost all universities, aside from those in the U. S. and Canada. It is interesting, and perhaps revealing to note that, particularly in Europe, demonstration of the ability to do original and independent research was often referred to as "preparation for an academic career." While some, or even most students might

take courses, the main tasks, for example, in Japan, "are to submit a doctoral dissertation and pass an oral examination within three years" (Clark, 1993, p. 308).

In some countries, notably China and Japan, it is possible to obtain the degree without being at the university by submitting evidence of research accomplishments, usually done while working in industry, that are acceptable to the faculty of a university or some national review panel. There are variations of this in other countries including the United States.

Doctoral education in the U. S. has been characterized for many years by the large numbers of students and institutions involved and by the integration of formal courses with research. Although the autonomy of the major professor has been maintained with respect to a student's program, most doctoral education has been programmatic, with groups of faculty members designing general programs within which students could specialize through their choice of research topics.

For the most part, this has been in marked contrast to doctoral education in other parts of the world, where it generally was a rather small enterprise in which students worked independently on research projects of their choosing with little or no formal coursework and with minimal guidance from a faculty member or institute researcher.

This began to change in the 1980s as many countries sought to expand their postgraduate programs to produce highly skilled people to keep pace with rapidly expanding and technically sophisticated industrial development. In addition, the rise of a global economy, the proliferation of multinational corporations, and the revolution in communication and information technology began to markedly affect some of the basic assumptions of graduate education.

Doctoral education, which for many years had been thought of primarily as a way to prepare people for university positions, was recognized as having much broader applications. That, combined with increased student demand, led to changes in doctoral education in the general direction of the American model, which had been demonstrably successful in producing large numbers of highly trained and well educated scientists and engineers.

Masters education in the U. S. had been highly professionalized, with the current needs of the workplace influencing the nature of the programs. This was particularly evident in fields like engineering and business, but not in the sciences, where the master's degree often took on the role of gatekeeper for entry into the doctoral program.

The 1990s have been difficult years for graduate education in the United States. Predictions made in the late 1980s indicated a large demand for scientists and engineers as well as for faculty members. Graduate enrollment rose dramatically during this time, especially in Ph.D. programs.

Unfortunately, a number of factors combined to invalidate those predictions, and new Ph.D.s, notably in the sciences and engineering, encountered difficulties in finding the jobs they desired, most specifically in research universities. This situation led to widespread discussion of the nature of graduate education, and many reports were produced. The most influential was *Reshaping the Graduate Education of Scientists and Engineers,* published in 1995 by the Committee on Science, Engineering, and Public Policy (COSEPUP) of the National Academies of Science and Engineering and the Institute of Medicine.

Two major recommendations of this report centered on broadening doctoral education so that students had a wider range of options, both in school and in careers, and on improving masters education, particularly in the sciences, to prepare people for industrial positions.

Many of the same kind of changes were taking place in other countries, all in the direction of preparing students to utilize their skills in a variety of ways and probably in a number of different careers.

It is ironic to note that as other countries moved to broaden doctoral education and make it more like the American model, we began expressing concern about the narrowness of our doctoral programs and trying to find ways to broaden them.

The changes being contemplated in most countries are in four general areas:

increasing the number of Ph.D.s produced, (e.g., Britain, France, Japan, and China);

broadening the formal training of doctoral students, primarily through coursework, (almost every country);

creating central structures related to American graduate schools, (Britain, Australia, China); and

establishing national, nongovernmental organizations for graduate education (Britain, Australia, China, Thailand, and Canada).

As usual, science and engineering drove most of these changes, and the basic issues were to provide an increasing number of students with broader backgrounds so that they would be better prepared for a wider variety of career options. In other words, graduate education was becoming more programmatic as student demand and employer diversity increased.

The idea of required courses, or of a graduate program involving both research and coursework, which has been associated primarily with the United States and Canada, is gradually becoming the norm in most places. In Britain, the discussion has centered on the relationship between research and research training, with strongly held views on the role of each in doctoral education.

An excellent summary of some of the arguments on either side appeared as part of a publication on postgraduate research training in Europe (Netherlands Ministry of Education and Science, 1991). A few of these are worth mentioning here because they provide a fascinating picture of an old debate in doctoral education, namely whether the primary purpose is to do research or to train researchers.

Those in favor of more training argued that adding coursework:

> provides a more structured transition between undergraduate and graduate school;
>
> provides a focus for student-student, and student-faculty interaction, lowers isolation;
>
> overcomes narrowness;
>
> provides a broad range of research skills, not just those associated with the dissertation; and
>
> increases employability.

Those opposed to a formal training component believed that:

> there is no natural set of techniques that would fit all students in a discipline;
>
> courses would be general, but students' needs are specific so valuable research time is wasted;
>
> the imposition of formal, compulsory courses calls into question the whole definition and meaning of a doctorate; and
>
> the imposition of formal training is the result of state-induced restructuring of the university system caused by a narrow conception of national economic need, accompanied by increasing emphasis on the industrial relevance of training.

It is important to try to make sure that students, faculty, administrators, and potential employers share the same view of the purpose of the program. Some interesting ideas were expressed in 1994 by Keith Pavitt, professor of science and technology policy at the University of Sussex. Pavitt (Pavitt & Kealey, 1994) suggested that for business:

> the main economically useful outputs of basic research is not "discoveries"or "ideas" that subsequently must be "exploited." Instead the main benefits are the expertise necessary for solving ... complex and multidisciplinary problems.... The most valued components of this expertise are trained researchers, improved

> instrumentation and techniques, background knowledge and informal access to world-wide networks of knowledge and skills. (p. 1)

This model has several implications. For one thing, Pavitt noted, there is no real distinction between basic, applied, or strategic research, because any can provide the same "components of expertise for practical problem solving." Second, and most important:

> [T]he economically most productive investment in academic research is in world-class research closely linked to postgraduate teaching. This is likely to provide the best training in problem-solving, the most innovative improvements in instrumentation and techniques, and the widest access to world-wide networks of research excellence. (Pavitt & Kealey, 1994, p 1)

For the most part, graduate deans and faculty members in the United States and Canada tend to take a broad view of dissertation research, firmly based on the idea that the major purpose of a doctoral research project is to prepare students for careers in advanced scholarship and independent research. It is not at all clear, however, that this goal is universally shared. Different conditions—scientific, economic, political, academic—can markedly alter the concept of doctoral education. Two examples will suffice:

As stated in a government policy paper on science produced in England in 1993:

> [The government] is concerned, however, that the traditional PhD does not always match up to the needs of a career outside research in academia or an industrial research laboratory. A minority of those studying for a PhD in science, mathematics and engineering can realistically expect a long-term career in university research.... The majority will move into other fields." (Chancellor of the Duchy of Lancaster, 1993, p. 57)

In an interview in 1994, Bruce Alberts, president of the National Academy of Sciences, was asked if we should be producing fewer Ph.D.s. His answer was "that if we're going to train with a very narrow Ph.D. that's really designed for people to be independent investigators, then we shouldn't be training so many" (Greenberg, 1994, p. 2). He espoused a different kind of graduate education that is much more flexible—so that its products could become K-12 teachers or journalists or be employed on the business side of technical companies.

These statements represent a real departure from a view of doctoral education as an apprenticeship based primarily on the shared research interests of the faculty to one that holds the career preparation of the students paramount. They reflect a perception that doctoral education is much too narrowly focused on research and not focused enough on education. Indeed, the

report *Reshaping the Graduate Education of Scientists and Engineers* (COSEPUP, 1995) arose in part from this kind of concern.

It seems clear that doctoral education is becoming more homogeneous in character throughout the world. In general, it is becoming more broad based within the field of specialization as well as across fields through participation in multi- or inter-disciplinary activities.

One outcome of this movement is that graduate students will be able to interact more effectively with colleagues in other countries (and their own) across a range of issues beyond the narrow specialization of their dissertation research.

In addition, international student flows, particularly to the United States, allow students from many different countries to know and work with each other. Unfortunately, relatively few American students in the sciences choose to study abroad, and this can lead to a certain level of provincialism, not so much with regard to doing science, but in terms of understanding the economic, political, and social aspects of science in different countries.

Scientists have collaborated with colleagues across national borders for years. Driven by research interests, scholars quickly identify others working in the same or related fields and establish contact. At one time this was done primarily through letters, phone calls, and in some cases spending time in each other's laboratories. All of this has been greatly facilitated by the use of e-mail and widespread Internet access. The increasingly global nature of business and industry also promotes internationalization of research and mandates a more international scientific work force.

Guy Neave (1994), in an editorial in *Higher Educçation Policy*, suggested that:

> The thrust to standardize around various elements and aspects identified with the American structure of graduate study—whether the French Ecoles Doctorales, the Dutch Onderzoekschoolen, or the German Graduiertenkollegen . . . may be seen as one dimension in a somewhat broader phenomenon, namely the internationalization of certification procedures for very highly qualified labor. (p. 10)

This implies that, in addition to the highly specialized knowledge gained through the students research project(s), certain general knowledge—the literature in one's field, research techniques and methodology, and standards for the criteria of proof—form a common currency for international exchange.

Stated somewhat differently, the doctoral degree, and in some fields (particularly engineering and the sciences), the master's degree, must serve as passports that enable people to enter into effective working relationships with colleagues in other countries and, increasingly, in other disciplines.

BROADENING THE SCOPE OF GRADUATE EDUCATION:

postbaccalaureate futures

It is always tempting to talk about the future, and as we approach the millennium, the temptation becomes irresistible. There is a sense of being poised on some sort of brink, reluctant to let go of the past as we prepare to step off into a very uncertain future, and so we keep looking back. It's been said that nostalgia ain't what it used to be, but the problem is, nostalgia is just what it used to be, a wistful but futile desire to go back to an earlier and presumably better time whose details get harder to remember with every passing year.

Further commentary about the future of graduate education appears in this speech, which was given at the April 1998 meeting of the Midwestern Association of Graduate Schools.

While thinking about that, I chanced to read a paper by my friend Bill Savage, director of UMI Dissertations Publishing, whose continued presence in the audience of graduate deans meetings, wherever they may be, always reassures me that I am at the right place. He wrote something recently that captured for me the essence of the problem at hand, and I would like to paraphrase it here:

> When elements of the past or present are uncritically superimposed upon visions of the future, they can impoverish the potential of what we hope to do and lead us to disregard what is good and useful about what we have done. (W. Savage, personal communication, March 30, 1998)

In other words, as we contemplate stepping into the 21st century, take a good look at both the baby and the bathwater before throwing anything out.

With that in mind, I want to take a quick look at where we've been as a prelude to a longer look at what I believe to be the conditions that will determine where we're going.

We reached the mid 1980s with a graduate educational system that had been fairly stable since the mid 1970s, and that was generally regarded, in this country and abroad, as the jewel in the crown of American education. It is a superb

system that provides first-rate education to over a million people a year. It does not, however, make all of them happy, nor does it provide all of them with assurance that they will find the job they want (or any job at all, for that matter) upon graduation.

But then, it is neither an employment agency nor an entertainment complex. Its business is to provide education. At least, that is what we have always believed. That is not to say that universities and, more specifically, graduate schools, should not be deeply concerned about the well-being and career fulfillment of their students. Universities like to think of themselves as communities, and most work hard at developing attitudes and services that improve the lives of the members of that community—students, faculty, and even administrators. But we are going to be forced to be much more specific about what our business is as we enter the next century, and find ourselves competing with a host of non-university education providers, all eager to give the customers what they want.

After the surge in enrollments that characterized the period from about 1958 to 1972, graduate education leveled off in terms of enrollment and degrees, but began to change in more subtle ways. Although the numbers looked about the same, social, political, technological, and demographic changes were occurring that would affect the nature of higher education in general and graduate education in particular.

The professionalization of master's degrees continued apace, with more new degree titles being added every day. The number of women undertaking graduate education began to increase significantly, as did the number of foreign students. The number of minority students increased slowly in the early 1970s, then leveled off for several years, and began to rise again in the mid '80s. The number of students seeking postdoctoral appointments increased in almost all fields, and postdoctoral experience became essential for those seeking academic positions in most science fields.

There was a gradual but persistent shift away from academic employment and toward other sectors by new Ph.D.s in most fields. Most projections were for ample opportunities for people with advanced degrees in the 1990s. Going to graduate school was widely considered to be a smart career move on the part of college students, but advances in technology suggested to many that, increasingly, graduate school might come to them.

The early to middle 1990s proved to be a disappointing time for many advanced degree holders, particularly Ph.D.s. Downsizing became the new management strategy in universities as well as business, industry, and government. For many, jobs became harder to find, and a fair amount of resentment grew among new graduates. There was much speculation about whether this was the old market-driven cyclical process, with the best thing being to just to wait it out until things returned to "normal," or whether there

was a real difference this time that reflected flaws in the structure and nature of graduate education.

The considerable literature that developed about Ph.D.s and jobs was dominated by several themes: that universities had overproduced Ph.D.s by not letting "the job market" influence the size of their doctoral programs; that faculty members were deliberately misleading students into going to graduate school to maintain a source of cheap labor for undergraduate teaching and to help with faculty research projects; and that students, having survived the rigors of graduate school and having obtained the Ph.D., were "entitled" to jobs doing independent research, preferably as tenure track faculty in research universities.

For example, Nelson (1995) suggested that, "The problem with graduate study now ... is that apprenticeship has turned into exploitation. Indeed, when apprenticeship leads to no future, it becomes not only unethical, but also pathological. Apprenticeship with no future is servitude" (p. 18). He stated that, "The collapse of the job market has made higher education pervasively corrupt. The display of our intellectual commitments lures students to the partial ruin of their lives" (p. 24). Referring to the situation in the 1980s, Ausubel (1996) wrote, "The market for Ph.D.s no longer drove the production of Ph.D.s but rather the need of the research enterprise for low-cost labor called graduate students and postdocs. The enterprise perfumes this reality by praising the effectiveness of joint education and research" (p. 11).

These words indicate more than a vague uneasiness about the state of doctoral education, and would certainly suggest that, in the eyes of some, graduate students really are helpless pawns being ill used and exploited by an uncaring establishment. They also bring to mind a comment by the great 19th century biologist T. H. Huxley, "This may not be the best of all possible worlds, but to say that it is the worst is mere petulant nonsense."

I have always found it interesting that one factor never mentioned as influencing the size of graduate programs is student interest and demand. There seems to be a tendency, as illustrated in the comments just quoted, to regard graduate students as tabulae rasae, whose motives and ambitions are provided by the faculty, rather than as smart people who actively seek out the graduate education they want.

Many institutions provide career counseling centers, and anecdotal evidence indicates that many, if not most faculty members try to help their students find jobs. But that is a far cry from the comment by a self-described "disgruntled, underemployed, underfunded, and almost disenfranchised Ph.D. scientist" who recently suggested that "any educational institution which grants a doctoral degree to someone must, if that person becomes unemployed for a significant time, provide him or her with a full-time position at that institution with an office, laboratory, and start-up funds" (Floyd, 1997, p. 183).

A number of articles and reports appeared during this period recommending major, and perhaps remarkable changes in graduate education. Probably the most familiar are *Reshaping the Graduate Education of Scientists and Engineers* (Committee on Science, Engineering, and Public Policy [COSEPUP], 1995), *Reinventing the Research University* (Patel, 1995), and *Scholarship Reconsidered* (Boyer, 1990).

All of these, taken together, promote a tremendous thrust to reinvent, reorganize, restructure, reconceptualize, rethink, reshape, and above all, to reform graduate education. There seems to be general agreement, particularly in the education and popular press that graduate education has to change. From what and to what are not always clear.

In trying to examine my own thoughts on what may happen to graduate education, I found myself returning to the phrase "postbaccalaureate futures." Used in its broadest sense, it seemed to capture all the things—the frustration and problems as well as the enthusiasm and opportunities—that we in the graduate community need to talk about these days. Under the broad umbrella of postbaccalaureate futures, for students, faculty, universities, graduate education, and graduate schools, I will define several issues and a few questions that frame the future for me.

One kind of issue concerns people seeking graduate education . . . who they are, where they come from, and what they want. We have used a number of terms to describe the experiences, trends, and rallying cries of the past 20 or 30 years, terms like multiculturalism, diversity, inclusiveness, internationalization, and globalization, but what it all boils down to is more and different—more and different kinds of students, who come from more and different kinds of places and who want more and different kinds of graduate education.

There is every reason to believe that this broadening of interest in postbaccalaureate education will continue. Currently, some 45 million Americans have baccalaureate degrees. There are indications that as many as 10% (4.5 million) are involved in, or are seeking some kind of continuing education related to their jobs and careers. As Peter Syverson (1996), vice president for research and information services at CGS, has pointed out, the new American graduate student is, statistically speaking, a working woman in her mid thirties with a family. That represents an astounding change over the past 30 years and is an indication of things to come.

Just as we have divided knowledge and information into an ever-proliferating array of disciplines, programs, and courses, we seem intent on differentiating the population, using every factor we can think of—race, gender, ethnicity, religion, citizenship, disabilities, sexual orientation, political persuasion, socio-economic status, and so on. There is no question that an intellectually diverse population makes for stimulating education, but as the graduate community becomes more heterogeneous, and different kinds of people get to know each other, it becomes

obvious that none of the aforementioned factors determines how or what a person thinks, for example, about the third law of thermodynamics, the existence of Gondwanaland, or the novels of James Baldwin.

Whether through specific initiatives or programs, simple population growth, or combinations of these and other factors, the postbaccalaureate community will be characterized by increasing numbers and a bewildering variety of people seeking a wide range of educational services that will provide them with marketable skills and credible validation of their educational accomplishments. Their focus on that goal rather than on their differences could lead to truly interactive relationships among different kinds of people whose common interests are enriched by their shared intellectual pursuits. It may be that postbaccalaureate education can serve as a model and a leader in fostering some kind of real community of scholars.

Another issue relates to the enterprise of graduate education itself—its content and culture, its myths and mores, its premises and practices. At its beginnings, it was a rather simple system, based on a small number of students choosing to forgo jobs and careers for a few years to learn more about what interested them. There was very little structure, and students were fairly independent, with minimal guidance from faculty. From that, we have developed a multi-layered, multi-faceted conglomerate that has subdivided knowledge into smaller and smaller packages, become programmatic at the discipline level. It is focused at the doctoral level on the research interests of the faculty and at the masters level on the practice interests of the professions. There is every indication that the next phase will focus on the learning interests of the students.

During the past few years, the system has begun to change in a number of directions and for a number of reasons. Two nondegree categories have become increasingly important: certificate programs and postdoctoral appointments. Both have grown rapidly, and in a relatively uncontrolled manner.

Certificate programs are completely undefined in terms of scope and standards. They can be offered by anyone, and depend, for clientele, on the assumption that the certificate will be accepted as a marketable credential by employees as well as employers. Donald Langenberg (1997), chancellor of the University of Maryland System, in a recent opinion article in the *Chronicle of Higher Education* asked if degrees and diplomas were obsolescent and suggested that people would acquire the education they needed on demand and in small doses, rather than reserving certain parts of their lives for a total immersion approach to degree programs.

Certificate programs are booming and probably will continue to grow. Many are relatively cheap to mount, often amenable to delivery using technology, can be brought up or taken down fairly easily, and offer great customer satisfaction because of their specificity. The interesting question is whether students are going to be satisfied with this kind of piecemeal education and certification, or

whether certificates will come to be seen as modular components in masters or Ph.D. programs. Will students want the kind of closure that degrees provide?

I have always believed that a program is what exists in the spaces between the courses, and that is what is missing for me in many of the certificate programs. Putting certificate programs together to build a graduate degree is not a matter of arithmetic, but an architectural challenge that may involve bridge building more than anything else.

Postdoctoral training is an entirely different matter. Over the past 25 years, the percent of new Ph.D.s taking postdocs has increased in almost all fields, but particularly in the sciences. It probably is accurate to say that to compete for a faculty position in a research university, a candidate must have had at least one, and probably two postdoctoral appointments. We perpetuate a fantasy by talking about time to degree in fields like chemistry and physics without adding the 3 to 6 years of postdoctoral experience. It's a long haul, and is becoming a national problem.

Although the postdoc experience can be rewarding scientifically, students live on the brink, usually depending on their sponsors grant renewals for salary and benefits. At best, it's an unstable situation, and no one is quite sure what to do about it. What we do know is that we have 50,000 or so highly skilled researchers and scholars who are adding to their education (and producing research) while trying to find jobs. No country can afford to be so profligate with its most highly developed resource. Government and industry could well consider developing research institutes, perhaps similar to Max Planck Institutes, connected to universities. These could be partially funded by industrial cooperatives, with companies in a given industry allocating a portion of their proceeds to support basic or applied research of potential interest to their industry. In addition to producing valuable research, this strategy would provide a reasonable source of career opportunities for postdoctoral scholars. I believe it would be a wise and prudent investment in the future of the country.

Most of the action during the last 4 or 5 years has concerned doctoral education and represents a mixture of justifiable pride in the enterprise, coupled with concern that it may be producing too many narrow specialists who are unprepared for jobs that involve more than extensions of their dissertation research, either in universities or anyplace else. This topic has been talked to death, and there has been a good deal of progress made in broadening the scope of doctoral education in many fields to prepare students for a complex and changing job market.

What makes most sense to me is for universities to become more differentiated, some cutting back on Ph.D. programs, some cutting back on enrollments in some programs, and some developing programs in interdisciplinary areas that appear to respond to current academic, student, and

employer interests and that are consistent with institutional mission and capability. Two factors militate against this.

The association of doctoral programs with institutional status and prestige continues essentially unaffected by flashes of reality or rationality. So long as university administrators and faculty members believe that the Carnegie Classification is a ranking system rather than a description of the wonderful diversity of American higher education, and that an institution needs to offer Ph.D. degrees to get to higher education heaven, we will continue to witness the unseemly spectacle of universities scrambling to advance in the ratings.

The institutional dislocations, in resources and priorities, that characterize this kind of academic social climbing often have, as their end result, turning a first-rate institution of one kind into a third-rate institution of another, usually at the expense of programs that could be truly distinguished and to the detriment of students whose graduate education may not be all that it could be.

In addition, the autonomy of the advisor will often prevail, particularly in the most prestigious programs, where many will see no compelling reason to change. That means that innovations and new approaches to doctoral education, broadly defined, are most likely to take place in the large public research universities, particularly as those changes are seen as preparing students for a wide range of careers. These institutions have the facilities, breadth of programs, financial underpinning, stability, and institutional self-confidence to experiment with new approaches. Smaller institutions are much more likely to contract program offerings and to try to identify specific strengths in which to invest.

Actually, doctoral education has not really prepared people for any particular career. Instead, it has given them excellent research skills and instilled in most of them the culture and ethos of the research university. But most graduates don't end up in that world and may feel as if they have landed on another planet when they interview for jobs at other kinds of educational institutions or at companies doing short-term, applied kinds of research. Programs like Preparing Future Faculty and industrial internships are effective in providing a more realistic picture of the world, and more approaches of this kind should be encouraged.

If doctoral education operates at the frontier of knowledge, then masters programs operate at the frontier of making it useful and available to students. As Donald Spencer (1986), then associate dean of the graduate school at the University of Montana, wrote 12 years ago in the *Communicator:*

> Unburdened by the imperatives of any tradition to which the academic community was passionately attached and lacking any but the most elemental and mechanical guidelines for structuring the degree, those faculties and administrators responsible for designing Master's programs have enjoyed a measure of discretionary authority essentially unique in modern American education. Thus, as tidal

> changes have swept across American civilization since World War II, the academic community has proven willing, on a campus-by-campus and largely *ad hoc* basis to adapt the Master's degree more readily than any other level of education. (p. 2)

The landmark study done by Conrad, Haworth, and Millar (1993) conclusively demonstrated that masters education really has been "a silent success," to the point where a steady 60% of college freshmen surveyed by Astin and his colleagues continued to specify it as their highest educational aspiration (Sax, Astin, Korn, & Mahoney, 1997). For most people, as well as for most universities and colleges, graduate education means masters education. The one place where that is not true is in doctoral programs that use the master's degree as a kind of indicator as to whether students should be allowed to go on for the Ph.D. Studies like the aforementioned COSEPUP report (1995), however, have suggested attempts to reinvigorate the degree, particularly in the sciences, for individuals interested in industrial careers.

With respect to the majority of masters programs, the question is not how many? Or—how useful? But just plain—how? How do we provide masters education (or any postbaccalaureate education, for that matter) to an increasingly complex group of people, especially those that find it difficult or impossible to achieve their educational and career objectives in traditional ways? To answer that question, I go on to the last of my three broad issues.

There is a great deal of concern about access—to graduate programs, financial support, faculty mentors, and jobs for students; to jobs, students, research support, and peer recognition for faculty; and to the major products of the university—knowledge and knowledgeable people—by every sector of society. The usual access question concerns access to graduate education, particularly by people who have not been participants in the past. For the most part we have approached this through the development of special programs designed to identify, recruit, enroll, support, retain, and graduate students who did not fit the traditional stereotype of the graduate student.

Some of these programs, like affirmative action, are now under active attack on many fronts. But special programs, by definition, will always be under attack precisely because they are special, and perceived as being outside of the regular (and presumably equitable) procedures of the university. What is long overdue is a hard look at our admissions criteria.

We know that the standard admission process is not very good at identifying students with high potential for completing graduate programs. Departmental admissions committees persist in misusing standardized test scores, grade inflation may make it next to impossible to have any idea of what students know by looking at their transcripts, and fear of lawsuits by writers of reference letters makes it increasingly difficult to rely on letters of recommendation. The graduate community needs to make a serious effort to identify better indicators

of success for graduate school, and might begin by bringing together diverse groups of students and former students to discuss this problem.

That might begin to provide some new approaches to the question of access for whom, but we have to direct some attention to the question of access to what? At one time the answer was—access to the university for advanced education, but that may no longer be the case. There really is no point in talking here about technology—which will only get faster, better, cheaper, and more interesting—except to ask, if technology is the answer, what is the question? If it is some variant of how do we make access to education more convenient, we may be getting close. We know it doesn't make it cheaper, and we are not sure whether it makes it better. Above all, we don't seem to know where to draw the line in terms of either the role or the responsibility of universities to compete for the educational dollar.

As we expand postbaccalaureate offerings, it becomes more difficult to describe exactly what we mean by graduate education. Postbaccalaureate is clear enough—it means after the baccalaureate. But graduate has had a different meaning, involving terms like advanced and scholarly, analytical and integrative, and it is just as clear that all postbaccalaureate education does not fit that description. It is also apparent that the market for postbaccalaureate education is much larger than the market for graduate education and liable to attract a larger group of vendors.

Putting all of this together, I find myself asking these questions:

Are there some irreducible, ineluctable core values in graduate education without which the enterprise loses both its identity and its reason for being? Do graduate educators agree on what they are? If so, does anyone else agree with us?

Could we articulate some broad-based vision of graduate education that would serve to provide an intellectually valid and operationally practicable basis for dealing with the issues raised above, to provide access for an increasingly complex population to an increasingly complex enterprise in ways that validate the educational activities and accomplishments of both?

Finally, what choices do we have about what we do and how we do it? In dealing with some of the difficult issues of our times having to do with student and faculty diversity, educational standards, scholarly integrity, and ethical practices, universities have been subjected to considerable political, social, and financial pressures. All human institutions adapt to their environments to survive, but universities have seemed particularly susceptible to bending their principles to conform to the ebb and flow of popular opinion and to backing away from, rather than taking stands on, difficult issues. Our constituents expect more from us.

I think as we try to understand where we go from here, it will be increasingly important for the graduate education community to define its capabilities, its

limitations, and its competition. In other words, we need to decide what business we are in, and once we have done that, to be sure that we mind our own business.

There will be endless opportunities to provide a variety of services, and many different approaches to doing so. There is no question that the scope of graduate education is broadening. But breadth is often achieved at the expense of depth. What will drive the competition for postbaccalaureate students? If more of these students are working people, convenience of access will be a major factor, and universities will have to adapt their schedules and the way they provide services to that reality. There is nothing either personally ennobling or educationally enlightening about making it difficult for students to get the courses, services, and materials they need to pursue their postbaccalaureate futures. But if universities, in their eagerness to serve a larger public, confuse easy physical access with easy intellectual access, we will have given up precisely what most of our students expect from us: high standards and a demanding and challenging education.

Graduate deans, working with faculty and students, have a wonderful opportunity to improve and expand graduate education using new and powerful tools and concepts. It won't be easy. For some, it will represent the worst of times; for others, the best. But we are in this business of graduate education because we believe in it, and love it, and want to make it better. The trick will be to "keep our heads while all about us are losing theirs and blaming it on us." But that's the job description of the graduate dean.

IS WHAT'S PAST (OR POST) STILL PROLOGUE? OR

"you used to be my used to was but now you're my ain't no more"

We tend to mark the passage of time in education, for ourselves as well as for our institutions, in terms of significant transitions related to the development of knowledge and skills. Our point of reference almost always is where we've come from rather than where we're going. Part of the reason for that is our belief, grounded in experience, that what's past is usually prologue, and part on the observation that nothing is more difficult to predict than the future. There are exceptions, one being the use of the term "predoctoral" which relates where we are to where we hope to go. On the other hand, the term "postdoctoral" refers to what we've done, and this implies a level of competency that has prepared us for what we are now doing.

This speech at Claremont Graduate University in March 1999 was written for the inauguration of archeologist Steadman Upham as president.

When "post" is used to refer to stages in education, it describes where you are in terms of where you've been and what you've done. Postsecondary, postbaccalaureate, postgraduate, postdoctoral—all are examples of defining the present in terms of the past, and involve not only considerations of time, but assumptions about levels of knowledge and skills as well. "Post" also implies continuity and perhaps even a stepwise progression from one level to another. But introducing the idea of level raises a whole set of questions, the most intriguing, perhaps being is what's past (or in this case post) really prologue? I'll expand on that in a moment.

When used to describe institutions, "post" often describes where we are now in terms of where we never have been before. It can signify a break in continuity, perhaps a paradigm shift, a different way of thinking about things. Not only is the past not prologue, but the operative phrase is likely to be, "Things will never be the same again." One example is the post-Gutenberg university, which

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made asynchronous, distance education a reality. Another is the post-Land-Grant university, which describes the changes in American higher education wrought by the Morrill Act. A more recent example is the post-Internet university, whose wonders are still unfolding.

While discussing these different meanings in different contexts, a friend referred me to an article written several years ago by Harvard professor Kwame Anthony Appiah (1991). The title is "Is the Post- in Postmodernism the Post- in Postcolonial?" Appiah concluded that it was not, although to use his words, both reject the claim to the exclusivity of insight of antecedent practice. One might say that the postcolonialists are backing into the future with their eyes fixed firmly on the past, while the postmodernists are looking ahead, having put modernism firmly behind them. This is a powerful image for higher education, particularly at a time when revolutionary, rather than evolutionary changes are taking place.

In recent conversations with two colleagues, one a Senegalese economist with the World Bank and the other a former vice chancellor of an Indian University, both commented on the difficulty of dealing with what they called their colonial "inheritance." In both cases they meant not simply discarding the education system or economic or administrative structures because they were part of a colonial past, but taking what was useful and using it in a new context.

All of the preceeding describes movement, a going from one place to another, while trying to determine what baggage to take along. We like to think not only that we've learned something from our experience, but that what we know will be useful and help us advance in the next stage. But, to paraphrase another friend, when elements of the past or present are uncritically superimposed upon visions of the future, they can impoverish the potential of what we hope to do and lead us to disregard what is good and useful about what we have done. In other words, as we contemplate "reforms" in graduate education, we must take a good look at both the baby and the bathwater to make sure we know which is which before we throw anything out.

It has been suggested that scientists and engineers seek solutions to problems, while humanists tend to celebrate their complexity. Since graduate deans represent a wide range of disciplines, they cover all of this ground. Graduate educators spend much of their time discussing the quantitative aspects of change, particularly in terms of money (too little), students (too many or too few), or jobs (too few of the "right" kind). These are extremely durable topics, and they can be found on the programs of any meeting about graduate education in any country at any time.

For the most part, however, there has been a strong belief in certain underlying principles related to the joys and rigors of scholarship and the concept of the Humboldtian University, in which, as Burton Clark (1993) has pointed out that Humboldt said right out that the university does not exist

primarily for students, nor even for faculty. Further, Humboldt believed that the teacher does not exist for the sake of the student. Instead, both teacher and student have their justification in the common pursuit of knowledge. This has led to a kind of comfortable confidence in the nature of the enterprise that has resulted in modest acceptance of tinkering around the edges but strong resistance to proposals that would lead to more deep-seated change.

There is good reason to believe that graduate education is undergoing major changes, changes that are leading to new ways of thinking about this increasingly complex mix of programs and processes. There is also reason to believe that we are trying to cope with the "colonial inheritance" of the German research university. These changes reflect two realities:

whatever is happening is increasingly global in impact; and

the basic issues have to do with relationships among people.

I will mention three of these changes.

The Nature of Doctoral Education

At the doctoral level increasing attention is being given to student career goals and to the quality of the graduate experience, prompted in part by the vagaries of the job market and by widespread discontent with the ambiance of doctoral programs. Whether it be a student suicide, a concern about the paucity of tenure track academic positions, a feeling of being exploited, or general unhappiness about relationships between students and advisors, the education press and the programs of professional meetings reflect widespread concern. In addition, many people believe that doctoral education is too narrow, too focused on the dissertation, and too concerned with learning more and more about less and less. The relationship between doctoral education and the job market is far from simple, but that notwithstanding, the perception exists that American universities are producing too many Ph.D.s who have been highly and specifically trained for jobs that are increasingly scarce and not prepared at all for the kinds of jobs that are available.

The past few years have seen a plethora of studies, and not just in the United States, that use words like reinvent, reengineer, rethink, and reform when discussing doctoral education. The remedies prescribed fall into three broad categories, and one way or another, many universities are investigating them.

The first is reducing the size of graduate programs, and doctoral production. Recent actions at Duke, Washington University, and others provide useful guidance in this area. The motivation is usually related to a combination of job market concerns, availability of resources, and the desire to improve the quality of students admitted and to provide them with a better graduate experience. There also are attempts to provide better data about the availability of jobs for Ph.D.s.

This is fraught with difficulty because of the problems in predicting or projecting what will happen to job opportunities during the time it takes to get a Ph.D.

It is somewhat ironic that now, when many universities in the United States are considering decreasing doctoral production, most other countries are going in the opposite direction, although there are signs that this is beginning to change in some places, for example, the United Kingdom, Japan, and France.

The second remedy is modifying the doctoral curriculum to provide students with a broader range of knowledge than that encompassed by their dissertation specialties. This usually is related to the idea of preparing students for a wide variety of jobs and careers. This has been particularly striking in other countries, where historically there was no program of courses associated with doctoral study, which was often represented by one student, one research problem, and one faculty member.

Some universities have developed minors and certificate programs in areas ancillary to the major field. In addition, courses and workshops on so-called transferable skills such as project planning, report writing, interpersonal communication, and time management, have been developed. Another approach has been to become involved in special programs that resemble internships, like Preparing Future Faculty, which expose students to the entire academic job market.

There are several programs designed to provide better information about the kinds of jobs and careers available to Ph.D.s. This is part of the approach currently being taken by the Woodrow Wilson Foundation in their project on Alternatives to Academic Careers for Humanists. The University of California, Berkeley study of Ph.D.s Ten Years Later, and institution-based studies of this type also will be useful.

The third remedy is more philosophical or cultural, and involves a shift away from what some perceive as an overemphasis on the research interests of the faculty, often to the detriment of the educational and career interests of the students. Much of it stems from a belief that faculty members are uninterested in the future employment of their students and consider them as nothing more than cheap, transient labor, and that the size of any graduate program is determined largely by the research obligations of the faculty and the teaching obligations of the department, rather than by the job prospects for graduates. Like most sweeping generalizations, this is overstated, some of it is misleading, and a good deal of it is simply wrong.

Sufficient concern has been expressed by graduate students, faculty, and administrators, however, that change appears to be taking place. Much of this change centers on the responsibilities of the advisor and the relationship of that role to the role of mentor. Graduate schools have approached this issue gingerly because of well-established attitudes of faculty autonomy, but the times have changed, and there is much greater receptivity to generic approaches aimed at

improving faculty advising than was the case several years ago. That in itself represents a change in culture.

An example is the suggestion in an article that appeared in *Science* a few years ago entitled "Interventions to Increase the Participation of Women in Physics" (1994):

> [I]t is not enough for faculty members to give good lectures and engage in world-class research. As educators, faculty members must also be concerned about providing a welcoming and supportive environment for their colleagues and their students. Constructive attitudes, a caring approach, open communication channels between faculty and students, and good will can go a long way toward enhancing successful outcomes for students and young faculty members. (p. 1393)

There is a growing understanding that a supportive environment in graduate school is not incompatible with high academic standards. Many if not most faculty have always known this, but enough have not to cause considerable problems for graduate students. Bad advising is not characteristic of any school or discipline. It varies with individuals. And graduate schools are beginning to address this problem in very direct ways. The most obvious manifestation of this is the great interest in mentoring and improving the lives of graduate students.

The Postcomputer and the Post-Internet University

Starting in the 1960s and '70s when computers began to pervade the way universities did their business and faculty did their research, it quickly became apparent that a sea-change was occurring. It wasn't just a matter of doing things faster (although that was a lot of it), but of being able to do things that couldn't be done before. The classic image of the graduate student carrying stacks of 3" × 5" index cards to and from the library changed to one in which the student carried stacks of punched cards, and then reams of printouts and then floppy disks, and now laptops. The slide rule and the Friden calculator found their way to the academic equivalent of a kitchen midden, to be dug up and wondered at by some future archaeologist. That icon of academic scholarship, the card catalogue, gave way, with much hand-wringing and dire predictions about the end of scholarship, to online catalogs that you could access from your home.

By the early 1980s the OED had become available in electronic form, and it was clear that it was an infinitely more useful resource since it could be sorted and searched in a variety of ways instead of just one. Word processors became available and changed the dynamics of dissertation writing. The postcomputer university had a dramatic effect on the way we did our work, particularly with reference to data and information, and as computer graphics developed we also gained some useful tools for classroom teaching. But there was relatively little

effect on the way we interacted with each other. For that to happen, we needed the Internet.

Michael Schrage (2000), a writer and consultant in the design and deployment of digital innovation in education, suggested that, "The digital technologies restructuring enterprise and academe are far less about the creation and management of new information than the creation and management of new relationships" (pp. 76–77). Each passing day seems to corroborate that insight particularly as we try to comprehend the role of the Internet in education. Unfortunately, much of the discussion of the uses of information technology in teaching and learning appears to be focused on its use as a delivery system for content rather than on how it will change and improve the ability of people to learn. Clearly, we have separated the development of content from the development of delivery, and both from the development of education.

The Caliber Learning Network is providing a system for the delivery of courses developed at Johns Hopkins, Teachers College Columbia, and the Wharton School. The quality of the content is based on the reputation of the university responsible for it. The quality of the delivery system is the responsibility of the vendor. The quality of the educational experience and who is responsible for that is undetermined. The easy answer is that it is the responsibility of the consumer to make that judgment. There is nothing new about *caveat emptor.* Brand names will play an important role, as they always have. The difference is that these "brand name" educational experiences can now be offered in your backyard in direct competition with your programs. This will raise issues that will be debated for a long time on the basis of form before anyone is willing to talk about substance.

On the research and scholarship side, one of the most interesting developments is that of the "collaboratories," whereby investigators in different locations can actually work together, perform experiments by remote control, analyze data, and discuss results, all in real time. The head of the Space, Physics and Aeronomy Research Collaboratory based at the University of Michigan recently observed that while controlling instruments from afar was one of the group's original goal, it gradually became clear that researchers valued the collaboratory more for giving them a venue for discussion and debate. They eventually phased out the technically difficult remote-control aspects and concentrated on being able to talk about what they were seeing rather than being able to twist or turn some dials on an instrument. Another group at Michigan, the Collaboratory for Research on Electronic Work (CREW) in the School of Information, stated that its mission is doing research on how new technologies enable new ways of organizing work. The implications for graduate education and research are myriad and obvious. The difficult questions for universities, as is often the case, are not technical or intellectual, but most likely administrative, political, and fiscal.

Postbaccalaureate Futures

A few months ago a conference was held under the auspices of the Council of Graduate Schools, the University Continuing Education Association, and the Kellogg Foundation. The purpose was to convene a group of people who usually don't get together, to talk about the changing nature of postbaccalaureate education. There were several graduate deans, some continuing education deans (two groups traditionally separated by a common interest in this topic), some lawyers, business people, a journalist who writes about technology and education, the head of a regional accrediting organization, the just-retired head of a private organization that develops certification programs and credentials for client groups, a former librarian at a major research university, the head of a corporate university, a labor economist with experience in workforce training issues, an equities analyst for an investment banking institution, and several other interesting people. Also in attendance were four presidents, two with many years of experience in several different very large public research universities, the head of the Open University in Great Britain, and the new president of Claremont Graduate University. Some of the things that we discussed follow.

The Meaning Of "Post" In Postbaccalaureate Education

Most broadly and literally construed, it can mean any kind of education that takes place after the baccalaureate degree has been completed. In general usage, however, the term has come to refer to certain kinds of educational activities directed toward the development of specialized knowledge, skills, or competencies usually related to jobs and careers. The Ph.D. and many other doctoral degrees (e.g., M.D., D.D.S., J.D., and D.V.M.) are not included in this category.

Postbaccalaureate education often involves nondegree academic experiences, such as certificate programs or courses, seminars, and workshops intended for individuals with various academic degrees. In practice, however, the master's degree has dominated this part of higher education, in terms of numbers of students, numbers of programs, and general design and philosophy.

The nondegree aspects, particularly certificate programs, may, in some cases, have little or nothing to do with prior education, and are "post" only in terms of time. On the other hand, some may represent a modular approach to masters programs, with credit from a number of sources being accumulated to be "cashed in" for a degree at some later date. In these cases, the level of the instruction would be based on assumptions about prior education and would be postbaccalaureate in nature.

The Changing Nature of the Workforce

There are approximately 44 million people in the United States with baccalaureate degrees. According to the 1995 National Household Education Survey, 39% of those who were employed had participated in at least one work-related course during the past year. Nearly 90% participated in formal employer-

provided training, either in house or through tuition benefits programs. The number of women in the workforce has increased dramatically, as it has in graduate education. The workforce is aging. In 1976, half of the employees were aged 16 to 34. By 2006, 63% will be in the 35 to 64 age cohort. The 45 to 64 age group has increased from 25% in 1989 to 30% in 1998, and is projected to reach 36% by 2006. More people are choosing to work beyond age 65. All of this fosters investment in employee education tailored to fit the needs of working people. The National Alliance of Business estimates that by 2001, over 50% of all education and training delivered by business and industry will be technology-based.

The Changing Nature of Work

Technology and globalization are two of the major factors changing the nature of work. Rapid advances in how things are done, accompanied by major shifts in where they are done are creating new kinds of jobs as old ones fall by the wayside. Thousands of people are starting businesses every year, and most of these are home based, relying on technology to connect with markets. It has been suggested that in this economy the keys to job creation and higher standards of living are innovative ideas and technology embedded in services and manufactured products. It is an economy where risk, uncertainty, and constant change are the rule rather than the exception. Knowledge and intellectual assets have become the most important factors in production and are closely related to wealth creation. Continuous education of the workforce and use of that education to further the corporate goals of companies providing or paying for it is driving an explosion of interest in postbaccalaureate education.

The Changing Nature Of The Education "System"

The huge market for postbaccalaureate education is attracting many new players. The for-profit educational providers, like the ones mentioned previously and the University of Phoenix, are enrolling thousands of students. Academic hackles are up at the news that Jones International University has been accredited by North Central, and other educational ventures are being planned as we speak. They will all be seeking to employ Subject Matter Experts (SMEs) on a piecework basis, and they will find them on our faculties. Peter Lyman (2000), in a discussion of digital libraries, noted that "the future of education will be determined more by intellectual property policy than by technology" (p. 106).

Currently there are some 1,400 corporate universities operating in the United States (and globally). They are as different from each other as universities are, and they are primarily concerned with providing the education needed by their employees to compete successfully. Many of them are not so much concerned with working with universities to provide training as they are with capturing their own corporate culture and knowledge base and transmitting it

within the company. Some are looking, as the head of Pfizer Research University put it, for "thinking partners" to help with this educational venture.

Alliances, consortia, and partnerships are being formed at a great rate. Some, like the California Virtual University, and Western Governors University, are having a tough time. For WGU, Open University-US is coming to the rescue, and then some. Through its partnership with Florida State and the California State University System, Open University-UK will begin to affect many educational operations here. The experience of the Open University in providing postbaccalaureate education to large numbers of students through distance learning techniques may prove extremely attractive to those considering various institutional and consortial approaches to providing education.

The nature of the postbaccalaureate education enterprise is beginning to mirror the increasingly fragmented way students are approaching postbaccalaureate learning, which is in smaller segments, at different times and places, in different formats, and from different providers. This observation gives rise to several concerns about what factors will be important in shaping the future of postbaccalaureate education:

Certification of accomplishment and credibility of certifying entity

Perception of quality and value by worker and employer

Responsiveness to learning needs of workforce

Relationship to institutional mission and values

Access, availability, convenience

Who pays and who benefits? (Cost brings up personal, corporate, academic, and public policy issues.)

It is clear that universities will be involved in whatever new education systems develop. The particular nature and extent of that involvement will vary by institution, given the extraordinary range of institutional type and mission to be found in higher education. But the role of the traditional university as the primary provider of postbaccalaureate education, and thus as the definer of what is an acceptable level and standard for this kind of practice oriented education, may be changing. Universities, because of the evolution of the new kinds of educational systems described here, may become partners in loosely defined educational coalitions whose structures, objectives, methods, and standards change to reflect current workplace needs. Whether universities can provide the leadership to make these coalitions effective, responsive, coherent, and educationally challenging avenues for meeting the knowledge needs of the workforce remains to be seen.

Conclusion—Core Values and the Nature of Universities

Historically, universities have provided a unique setting and a particular context for higher education, one that may well define their role in an uncertain future. At their core, they have been more about education than training, more about knowledge than information, and, ultimately, more about scholarship than research. The difference, in each case, is whether the acquisition of specialized learning is considered as an end in itself, or as the beginning of a process that leads to a higher level of understanding. I think that is what Hutchins (1936), and later, Bok (1986), meant by the "higher learning."

There will be limitless opportunities to provide a variety of educational and scholarly experiences and many different approaches to doing so. There is no question that the scope of graduate and postbaccalaureate education is broadening. But breadth is often achieved at the expense of depth. What will drive the competition for postbaccalaureate students? If more of these students are working people, convenience of access will be a major factor, and universities will have to adapt their schedules and the way they provide services to that reality. There is nothing either personally ennobling or educationally enlightening about making it difficult for students to get the courses, services, and materials they need to pursue their postbaccalaureate futures. But if universities, in their eagerness to serve a larger public, confuse easy physical access with easy intellectual access, we will have given up precisely what most of our students expect from us—high standards and a demanding and challenging education.

It is one of the paradoxes of language that when we talk about moving to a higher level of education what we usually mean is attaining a deeper level of understanding. How digging deeper into the past helps us understand how to take education to a higher level in the future presents a conundrum that might require specialized knowledge to resolve. This is an emergency! Is there an archaeologist in the house?

NUMBERS LAST:

a proposal for improving departmental or program based graduate admissions

Good admissions practice mandates using as much information as possible to inform the admissions decision. The information generally is of two kinds: numerical, such as grade point averages or scores on standardized tests, and narrative, such as letters of recommendation, autobiographical statements, and personal interviews. But the order in which these admission elements are viewed can affect the outcome. The way applicants for admission to graduate school are evaluated by departmental admissions committees provides a good example.

This piece appeared in the November 1999 issue of Communicator.

In many departments, particularly those dealing with large numbers of applicants, there is a tendency to use undergraduate grade point averages and standardized test scores to make a first cut in evaluating applicants. Sometimes these numbers are combined in various ways and incorporated into formulas designed to generate a composite number that is then used as a cut-off score or threshold for further consideration. When making inherently subjective judgments, any possibility of reducing things to numbers, or better still, formulas or equations, is often valued because this gives the impression of precision in what is essentially an imprecise process.

There are many problems with this approach, but the most serious is that these numerical scores probably give the least useful information in helping to decide which applicants have the greatest potential for doing well in a graduate program. Nevertheless, when they are the first thing examined, they tend to dominate the decision-making process. No matter what else is involved, the impact of these seemingly precise measures endures. Numbers last.

I want to suggest a different way to conceptualize the departmental admission process that is more directly related to the goal of finding the students most likely to succeed in a particular graduate program. I believe this approach will be more effective in making good matches between applicants and programs than those that place heavy reliance on numbers. It has the advantage of being tailored both to the changing nature of the fields and the particular emphases of

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the program. In addition, as departments seek ways to increase access and diversify their graduate student populations, it increases the chances of identifying good prospects with nontraditional or unusual backgrounds.

Step 1. The department graduate faculty should meet and reach consensus on what personal attributes they believe are most important for students to be successful in the program. These could include things like perseverance, creativity, imagination, critical thinking, and intellectual independence. The same approach should be used in defining skills that are necessary in the program. These could include generalized categories, like quantitative skills or research experience, as well as specific competencies such as knowledge of a foreign language or specific subjects or techniques. The choice of these qualities should be based on the experience of the faculty with former applicants and their own sense of the nature of the field. The graduate students in the program should be involved in discussing these topics, and, together, a shared vision about the purpose of the graduate program should be developed.

Step 2. The Admissions Committee should decide on what to examine as indicators of these attributes and skills. In all cases, qualitative information, such as letters of recommendation and autobiographical information (including statements of interest in the particular field of study or program) will probably be most useful.

Step 3. Materials should be developed to be shared with prospective students informing them of this approach and emphasizing the importance of submitting substantively useful documentation.

Step 4. The relevant information should be collected from applicants and used in making initial admissions decisions.

Step 5. Numerical data such as grade point averages and scores on standardized tests should be examined last and used to modify or adjust impressions gained from the other information received.

Numbers last.

Part Two

A PASSION *for graduate education*

This paper was written for The Graduate Voice, the graduate student newsletter at The Ohio State University, in the Spring of 1984 as the author was leaving the graduate school to assume the presidency of the Council of Graduate Schools.

Along with some of you, I will be leaving Ohio State this June. My 26 years here put me past all deadlines: It's time for commencement. During the time I have been here I've been involved, one way another, with graduate education. Gradually that involvement became more intense, but at the same time more diffuse. Graduate education as a general idea rather than as a specific process began to take up most of my time. It still does, and during the coming years with the Council of Graduate Schools, it will do so even more. I'm pleased about that. It's a good cause—one I believe in. As I think about that and try to understand it, I keep returning to one idea. In almost every time and every place there have been people who have felt a compulsion to learn all they could about something, and the range of something covers everything imaginable and then some. This urge to study in great depth—to understand—is, I believe, the single underlying principle in graduate education. It is the motivation for scholarship and research in every field, and it is a personal motivation that is unrelated to jobs or to money or to anything else but the need to know.

Jacques Barzun in *The House of Intellect* (1959) stated that passion is the essential element of work, writing, "It is passion in work and for work that gives it its dramatic quality, that makes the outcome a possession of the worker, that becomes habit-forming and indeed obsessional" (p. 125).

I would be unrealistic if I believed that all graduate students are so obsessed. We use graduate schools for many things today including job training and certification, and the lines between graduate and professional education have become so blurred as to have almost disappeared. But I would be more unrealistic if I did not see that there is a clear, unbroken line of scholarship in every field, and that the knowledge that comes from that scholarship is the only basis we have for understanding our lives and our world and how they are related.

I am going to Washington[10] at a time of widespread concern about the quality of education in the United States. That graduate education is not exempt from

[10] The location of the office of the Council of Graduate Schools.

this concern can be seen from the titles of two recent reports, *Signs of Trouble and Erosion: A Report on Graduate Education in America* (National Commission on Student Financial Assistance, 1983) and *Scholarship and Its Survival* (Pelikan, 1983), both completed in 1983. The first of these reports, from the federally-appointed National Commission on Student Financial Assistance, deals primarily with the erosion of support—for students, for faculty, for libraries, for scientific equipment—and urges the federal government to recognize more clearly its obligation to provide funding commensurate with our need, as a nation, for knowledge and the capability to use it.

The second report, an essay by renowned scholar Jaroslav Pelikan, speaks primarily to the erosion of passion—for scholarship, for high standards, for intellectual integrity—and urges the academic community to recognize more clearly its obligation to educate and train scholars and scholarly people.

I've heard that graduate students are not a particularly effective political force because they are transient and tend to be concerned only about issues that affect them directly while they are students. I am not convinced that is true. But even so, I wonder about the long-term responsibility of former graduate students. After all, you are a graduate student for a relatively short period of time; you will be a former graduate student for the rest of your life. You will have participated, at least to some extent, in this searching process called graduate education, and, if you are fortunate, you will have found work to be passionate about. That may not be enough.

We—you and I and others involved in graduate education—have an obligation to try to ensure a strong and vital graduate enterprise, and we can be effective by doing what all graduate students—former, current, and future—are prepared to do: define issues clearly, become well informed, analyze information critically, draw reasonable conclusions, and present cogent arguments to support those conclusions.

We need to be dispassionate in our analysis and passionate in our advocacy. It's worth fighting for.

AN ATLAS *for scholars*

In his book *Arctic Dreams,* Barry Lopez (1986) devotes one chapter to what he calls "the country of the mind." In it he describes the way people, particularly Eskimos, relate their lives to the land they inhabit, and he refers to that intriguing geographical interest called mental maps, that is, the maps that people construct in their minds in order to place themselves in their environments. Mental maps are very flexible. They may contain images of people or places, works of art, sounds, smells, equations, aphorisms, mythical creatures, abstract symbols, or anything else that has meaning for you and helps you find your way.

This address was presented at graduate convocations in 1987.

A representation of one of the most familiar mental maps appeared on the cover of *The New Yorker* magazine some years ago. I am referring, of course, to Saul Steinberg's famous map of the world as conceived by a New Yorker. As you might expect, most of the map portrayed the city of New York, particularly Manhattan, which occupies considerably more space than the rest of the world combined. It made the point very well. As Lopez (1986) said:

> The mental maps of both urban dweller and Eskimo may correspond poorly in spatial terms with maps of the same areas prepared with survey tools and cartographic instruments. But they are proven accurate guides of the landscape. They are living conceptions, idiosyncratically created, stripped of the superfluous, instantly adaptable. Their validity is not susceptible of contradiction. (p. 295)

A graduate commencement is a particularly appropriate place to talk about the mental maps that scholars make. Those of you receiving your degrees today, in this uniquely academic celebration, that recognizes, in its ritual and its regalia, continuity in the scholarly world, have already created maps that obviously have been good ones. They have brought you here today, perhaps with a few side trips along the way, and sometimes by rather circuitous routes; but they are your maps, and here you are "not susceptible of contradiction."

For a few moments today, I should like to explore with you the scholar's world. I want to construct an atlas, in this case a collection of mental maps that describe this particular country of the mind. Atlases are organized with the most general maps, those covering the largest areas, in front. Succeeding pages contain maps of smaller and smaller areas, each expanded in scale to show the

fine detail. The first map usually is an overview of the entire world, and since this is a day for tradition, let us begin in the traditional way.

If we think about the history of scholarship in terms of a world map that exists in both time and space, we would see that at certain times and in certain places, for reasons not always well understood, an atmosphere existed that caused scholarship to flourish. Most often, this happened in great cities, crossroads that attracted people of varied backgrounds, beliefs, and experiences. They served as meeting places where ideas as well as goods could be exchanged. Groups of people gathered in these places to talk and argue and extend their intellectual interests. Some found this so good a life that they stayed. Word of their existence spread and others, particularly young people and people dissatisfied with the limits of their own knowledge, began to seek them out.

Scholars always have been travelers. They have learned where new ideas were being explored and have gone there to seek not just enlightenment, but kindred spirits as well. Although the life of a scholar is often depicted as a solitary or lonely one, scholarship is really a social activity, and its practitioners are strongly driven to test their ideas in the company of those whose judgment they value. And so communities of scholars grew and flourished, and the map of the scholarly world, in the early days largely a map of great cities—Athens, Rome, Peking, Alexandria, Berlin, Bologna, Paris, London—gradually became a map of the places where great universities were located. If you had drawn this kind of map before the middle of the last century, America would not have appeared. In the middle of the 19th century academic leaders argued for the teaching of practical subjects in an attempt to change the essentially classical curriculum prevalent in American colleges at that time, but it was still too early for the concept of the research university in this country. Americans seeking the company of scholars were going abroad to the great European universities to study and learn.

It is quite different today. The development of American research universities over the last 100 years—a phenomenon unprecedented in the scholarly world—has led to the creation of a new map, dominated in many ways by these remarkable institutions "whose mores and practices make it clear that enlarging and disseminating knowledge are equally important activities and that each is done better when both are done in the same place by the same people." (Rosenzweig, 1982, p. 1).

This university is such a place and, like some great ancient city, it has attracted students and faculty from all over the world to come and learn together. Scholarship flourishes in dozens of fields, each with its own paradigms and paradoxes, and each with its own mental maps. The map of the entire scholarly world has provided the overview. Now we need to turn the page of our atlas and go on to the section that maps the disciplines.

There are several kinds of maps to be found here. The first might resemble a map of a continent, showing the various countries and their relationship to each other. At one level, dealing with the scholarly relationships that exist between and among the disciplines, we can see rather clearly defined regions—the natural sciences, the social sciences, the humanities and so on. There are certain regional characteristics, not the least of which is some elements of a common language that facilitate travel and communication within the region. The borders within regions are relatively open, although at times rather vigorous border disputes have broken out. Some of these have been resolved by migration but in other cases entire new areas have been created, very often with names that reflect their origins, names like biochemistry or psycholinguistics.

The borders between regions are usually much more substantial; in fact, they may resemble actual physical barriers, like a mountain range, surmountable at some risk and certainly some discomfort for those who want to make the effort. Usually there is no common language, and attempts to communicate are often frustrating and require not only mutual good will, but also the actual acquisition of another language. Because of this and other culture-related reasons, serious scholarly travel between regions is fairly rare. Most of the traveling is done by those few restless souls who find the travel itself to be stimulating or by tourists off for a holiday and looking for something exotic and different.

At another level, that is, when we look at the entire continent, what we really see is a map of the university, that confederation of disciplines that is held together not so much by scholarly interactions as by some general philosophy of education. Much of the attention of the academic world today is devoted to trying to find ways to have the understanding gained through scholarly work enrich the learning of undergraduates. It is a challenge of great consequence, because the future of scholarship itself is tied to the state of general education.

But it is time to move to the next section of the atlas, which consists of detailed maps of the disciplines. You have spent a good deal of time during the past few years learning abut the map of your discipline, becoming familiar with the great names and places. If you are an organic chemist, you have been drawn to Germany in the late 19th century, or as biologist you may see in your mind Darwin in the Galapagos. Historians and literary scholars may be more familiar with the streets of 18th century London or ancient Rome than they are with their own neighborhoods. Every scholar carries such a map and at some point feels real kinship with colleagues who have inhabited the same part of the scholarly world. That is part of the continuity we are celebrating today.

There is another kind of map of the disciplines, however, that dominates the thinking of scholars. It is like a topographic map, showing the nature of the terrain. If you think about that, you might imagine a kind of intellectual map of your discipline, one that deals with ideas rather than places. On a map like this, certain ideas, certain concepts, would dominate the landscape like great

mountains, challenging the generations. Some would shine like beacons, providing direction and purpose. Others might be like ghost towns, places where some precious substance was mined for a while and eventually, or suddenly, ran dry. You would see places that had been prominent because they had been important way stations between other places but that, like towns passed by the railroad, had fallen victim to technology or just to the times. Nobody goes there anymore. You might see great highways—new ways to get from one place to another—that stop in the middle of nowhere because the funding ran out. You would see places where battles had been fought and others where great walls had been erected but inevitably had been breached by the inexorable force of ideas.

Above all, however, you would see a network connecting the minds of all the scholars in your discipline, past and present, a network that transcends borders and biases, that stretches and flexes but does not break, a network that depends for its strength on the integrity of scholars communicating their ideas freely and openly, a network to which you now belong.

Much of your time in graduate school has been spent making this map part of you. In your early years you concentrated on learning what was known—in map terms, where things were. Yet as you learned this, as you became confident in your knowledge of your field as currently understood, you became aware that each step you took brought you closer to the place on the map labeled "terra incognita," the unknown land, where you had to go to make yourself part of the map of your discipline. Many of you here have made that trip, and your work has changed the map.

Your presence here today also has another meaning, one you may not have considered. In a way, the entire history of your discipline, the great works of intellect, the critical experiments, the flashes of insight, the step-by-step construction of that map, has, as its crowning achievement—you. At this moment you are the latest, most up-to-date product of generations of scholars. You incorporate, within yourself, the accumulated learning and lore of your field. You have the advantage, if only for a short while, of viewing the whole thing retrospectively, seeing the connections and the gaps, and deciding what you are going to do.

Peter Gould and Rodney White in their book *Mental Maps* (1986) began the very first chapter with the words, "Where would you like to live?" Where would you like to live in the scholarly world I have been describing? Most of all, you will want to find a place with congenial neighbors; intellectual isolation is intolerable for scholars, and always has been. Any map of the scholarly world shows that. Many of you will find what you are seeking in universities, where trying to understand the interaction among the disciplines that produces general education may lead you in directions that will affect your scholarly work in ways

you cannot yet imagine, and where the opportunity to work with students will become a major part of your scholarly life.

Others will find industrial laboratories, or museums, or some other setting ideal places to pursue their work. In any case, the maps described so far provide some guidelines, some benchmarks, and a way to orient yourself as you contemplate your next steps. That is important, because you also have to decide where to live in your field of interest. You began that process when you started your graduate work, and the last map in your atlas is really the working map of an explorer. It contains lots of empty spaces, the beginnings of a few roads (some of which may never be completed), many question marks, perhaps a note about the place where you think you saw a mirage, and down in the lower right-hand corner your best guess about the scale.

In contrast to the maps explorers carried in the past, yours probably represents the latest advances in technology. It may appear in your mind like a computer terminal with a map in at least four colors and subject to continual modification consistent with the best and most recent information.

But it is not the map that links you to your scholarly colleagues; technology alone has never been enough. It is the scholarly imagination that transcends time and space. The idea of seeing what no one has seen before that lures you on with the same sense of wonder that Keats (1875) described when he wrote:

> Then I felt like some watcher of the skies
> When a new planet swims into his ken;
> Or like stout Cortez, when with eagle eyes
> He stared at the Pacific—and all his men
> Look'd at each other with a wild surmise—
> Silent, upon a peak in Darien.

Yours will be an exciting journey. Bon voyage.

REDUCING *the deficit*

I want to talk to you today about reducing the deficit. That has been a popular theme during the past few years, and it continues to be today. However, I am going to approach this topic from a different point of view and discuss the kind of deficit—or deficits—that have been of greatest concern to universities. Let me begin with the deficit of information.

There is little question that, over the years, there has been considerable reduction of this deficit, and all indications are that the rate at which this deficit is being reduced is increasing rapidly. At least we are accumulating more data and seem to be converting it rather readily to information.

First used for graduate commencements in 1986, the deficit speech was reprised in 1994,

Some people believe that we have reached a state of surplus, that is, that we have too much information. That is hard for me to believe, and I am sure anyone who has gone through a graduate program would seriously question the statement that you can have a surplus of information. Perhaps more pertinent are the issues surrounding the economics and politics of information. Information has become a commodity with real value, and access to information has become increasingly important. There is so much information available that being able to find it, get it, and use it has become a necessity and has given rise to a new industry. It is an industry that we talk about a great deal—the information industry—and one that has affected graduate education very directly.

We are all faced with the problem of finding ways to sort through mountains of material to locate and obtain the information we need. But we are reducing the deficit in information and reducing it rapidly.

If we view information as raw material and think about what we generally use it for, I think it is accurate to say that information is used to create knowledge, and that the transformation of information into knowledge is an integrative process that takes place in someone's mind. The name generally given to that process is scholarship, and when the knowledge resulting from it is shared, it becomes what has been called "public knowledge," that is, the consensus of what we know at any time.

Information and knowledge are related in an interesting way. Daniel Boorstin (1980), as the Librarian of Congress, referred to schools, colleges, universities,

and libraries as the Knowledge Industry, and contrasted it with the Information Industry. He pointed out one way to understand the difference: While you can inform people, you can't knowledge them. Becoming knowledgeable is something you have to do yourself, and it is an active rather than a passive process.

There is a deficit in knowledge and that deficit is being reduced more slowly than the deficit in information. A basic question here deals with the rate at which information is converted into knowledge, and although the process seems to be speeding up, the nature of the limiting steps is not well known. Certainly it is not just a question of putting more people on the job. The history of knowledge and its creation tells us that often a single person at the right place, at the right time, and with the right background looks at what many others have looked at and sees what no one else has ever seen before. The question is how to make sure that we provide opportunities to those who have the potential to make that kind of difference. Finding the answer to that question requires us to go beyond knowledge to wisdom.

Unfortunately, the deficit that seems to be reduced most slowly is the deficit in wisdom. Once we accumulate all this information and laboriously turn it into knowledge, we are faced with deciding how to use it and what is important to do. That takes wisdom and we need a great deal more. It is a major problem.

Speaking of problems, I must tell you (although I don't think you'll be glad to hear it) that in this case we have no deficit. Indeed, with respect to problems, we clearly have a surplus. Some of these are old problems, often having to do with how we treat each other as human beings. Our inability to solve them usually is the result of a deficit in wisdom. Sadly, we seem to make the same mistakes over and over again. Others are problems that cannot be solved because we don't yet have the information or knowledge we need. Paradoxically, however, some are problems resulting from an increase in knowledge.

A good example is the environment. We didn't think much about the environment 50 years ago. We didn't know much about it and about how our actions, particularly those that were the result of new technologies, might affect it. Our concerns today are the result of our expanding knowledge about the consequences of those actions, and we need new knowledge so that we can cope with the complicated issues involved. The ability to do things we didn't know how to do before will always create new problems as well as the need for problem-solvers.

These will be people with specialized training set in the context of broad-based education—that is, people like you who have undergone a long and rigorous educational apprenticeship that not only prepares you to understand the important issues and to ask the right questions, but also to develop ways to find answers to those questions. That really is what graduate education is all about.

People who choose to go to graduate school usually exhibit two general characteristics. One is what I would call focused interest, and it was exemplified best for me several years ago at a meeting I attended to plan a contest for book collectors. As part of the program, a local book dealer made some comments about the behavior of people in bookstores. She had noted that there were two broad categories of bookstore browsers. She referred to one type, who tended to look at everything and who might buy books on any kind of subject, as accumulators. Accumulators were interested in a great number of things; they were generalists, in the best sense of the word.

The other type she designated as collectors—those who had developed a special interest and devoted most of their bookstore time to searching for books that were related to that interest. Some collected books on a specific topic, some collected books by a certain author, some got more esoteric and collected books with certain types of bindings or illustrations. There really was no way to tell what particular thing would turn an accumulator into a collector, but once it happened, you never were quite the same again.

She made another observation. Some accumulators and a few collectors made their way through the stacks looking only at titles on the middle shelves, since that was easiest to do. But the really serious ones would get down on the floor to see what was on the bottom shelf or climb up on a step stool to make sure they weren't missing anything on the very top.

All of you have become collectors. That doesn't mean you have lost interest in a wide variety of things. It means that one particular subject or field has become not just interesting but fascinating, and that you have found a way, through graduate education, to make it your life's work. We are all collectors, but we need context—some ability to see our collection in relationship to the rest of the world. We get that ability by also being accumulators and by letting the two—the general and the specific—enrich each other. You here today represent the fusion of those two elements. Now let me add a second component to that focused interest: the element of passion.

Jacques Barzun, in his book *The House of Intellect* (1959), stated that passion is the essential element of work. Clearly, he was not describing labor, but rather what each of us thinks of as "our work"—what we do. He wrote, "It is passion in work and for work that gives it its dramatic quality, that makes the outcome a possession of the worker, that becomes habit forming, and indeed obsessional" (p. 125). These two qualities, the focused interest, an intellectual term, and the passion, an emotional term, come together uniquely and especially in graduate education.

It is usual for people who go through the kind of preparation that you have had to see the utility of that education in a very direct way. After all, you were attracted to graduate school by an intense interest in a discipline or in a career, and you are now ready to apply all that you have learned in pursuit of your own goals. Some of you will go on from here to add to the knowledge in your

disciplines. Some will work to shape the practice of those disciplines. Some will teach, and some will become leaders in their professions. Many will be involved in all of these activities. But let me urge you to go beyond that.

At one time, it was believed that a major role for universities was to prepare "public citizens," that is, people who were expected to act intelligently and wisely in the public interest and to be leaders in their society. It is time to return to that concept and to view your knowledge, talents, and abilities, as refined through your education, not just as personal possessions, but as a public resource. That, after all, must be the principal return that society receives for its investment in your education.

If we are to continue to reduce the deficits in information, in knowledge, in wisdom, and in knowledgeable people who choose to devote their lives to these things, it is imperative that you bring your talents to bear on the important issues of our times, and that you transmit your enthusiasm, your interest, and your passion to others, particularly young people, so that they have the opportunity to make the choices you have been able to make. Think about how you came to this point in your lives. Think about the people who helped, who encouraged, who explained, who taught, and, above all, who inspired you. Take it as your responsibility to do the same for future generations.

We need a wiser world. You can help make it so.

THE CORNER *of your eye*

I want to spend a few minutes this afternoon talking about graduate education, particularly your graduate education. It may not be as easy as it sounds.

One approach would be to describe the different programs you represent and to say a few cogent things about each one. Three minutes about business administration, then three minutes about chemistry, then maybe three more about history, and so on. After all, graduate education is specialized rather than general education, and you have studied different things and see the world differently, each from the vantage of your specialty. But I don't think that would be particularly useful, mainly because it wouldn't enable any one of you (or me) to think about what has happened to all of you during this intellectual journey called graduate education.

This commencement address was given in May 1997 and June 2000.

What is most intriguing to me about this gathering is not your differences but your similarities. The case I want to make is that the level of education, graduate education, that has brought you to this commencement ceremony has certain characteristics that apply to all of you, regardless of your area of specialization. Recognizing this can influence the way you think about your education, your career, and your life. But to be able to see what those characteristics are, we could use a little help, namely, some good working metaphors.

A few years ago, Lewis Thomas (1983), an American scientist and writer, wrote an essay titled, "The Corner of The Eye." In it, he commented on the fact that there are some things, for example, faint stars, that humans can't see if they look directly at them. The only way to see them is to look at them out of the corner of the eye. Of course, the purpose of the essay was not to describe the physiology of the eye, but to develop a metaphor for the way that the human mind sometimes works. I want to extend that metaphor to the way you think about your graduate education.

During the last few years, and particularly during the last few months, you have been looking directly and very intensely at your graduate programs. What I am suggesting today is that what you have learned in graduate school may be somewhat different than you think, and that it might be useful to try look at your graduate education "out of the corner of your eye."

To set the stage for that sidelong glance, you need to recognize that during the time you have spent in graduate school, the way we find, obtain, and use information has changed dramatically. Those of you graduating today are among

the first generation of students who have had relatively unrestrained access to the Internet and the World Wide Web. At the click of a mouse, in the comfort of your home or office, you can communicate with your colleagues all over the world, and summon up more information than has ever been available to anyone, all literally at your fingertips.

All you have to do is type in a few words describing your interests, and in a split second you may be informed that there are 12,863 pieces of information related to the topic that are available to you. The technology will only get better and faster, and the amount of information will continue to increase.

As we enter the next century, and you begin your careers, one of the challenges you will face will be trying to understand how to deal with all this, and what it means to live, learn, and work in this "Age of Information." One of the problems is that information expands much faster than the ability of the human mind to process and integrate it into knowledge.

The best description of this situation I have ever seen was written in 1939 by the American poet Edna St. Vincent Millay, and, as is so often the case with poetry, provides us with another good metaphor. She wrote:

> Upon this gifted age, in its dark hour,
> Falls from the sky a meteoric shower
> Of facts . . . they lie unquestioned, uncombined.
> Wisdom enough to leech us of our ill
> Is daily spun; but there exists no loom
> To weave it into fabric. . . .

We are inundated with facts and information and are desperately trying to find or construct that loom. The obvious place to look for it is in the universities, and their role and future in this "Information Age" has been the subject of much speculation. Some have suggested that universities are becoming obsolete, and if we define them in terms of their ability to store and disseminate information, then their future is indeed uncertain, since those particular functions are tailor-made for our new technologies.

But if we look at universities out of the corner of the eye, it becomes clear that teaching and learning have to be about more than acquiring information, and that the strength of the future university will reside less in its role as storer and disseminator and more in its role as credible validator of information. That implies that information is the raw material, the first step, in a more complicated process that often starts with the questions how and why.

Philosophers of education have usually thought about universities in terms of knowledge rather than information. Daniel Boorstin (1980), the historian and former Librarian of Congress, in a paper discussing the relationship between the

Information Industry and the Knowledge Industry (colleges, universities, libraries), differentiated these terms in an immediately accessible way by reminding us that while you can inform people, you can't knowledge them.

During your years in graduate school, you have gathered and absorbed a lot of information. You have been informed, but you haven't been knowledged, and even though the way you become informed has changed dramatically, the way you come to know things is still the old fashioned way. You earn it.

You have to take information and think about it, discuss it, argue about it, challenge it, integrate and synthesize it, and finally, through your own hard work, become knowledgeable. There comes a point in the education of any graduate student when you begin to think of yourself not in terms of how much information you have at any moment, but in terms of what you know all the time. What gives you a professional identity, as a chemist, or a historian, or a software engineer, or any of the specializations you have pursued here?

Right now, the specific aspects of your graduate education probably are uppermost in your minds, particularly as you think about jobs and careers. I want to urge you not to neglect the broader dimensions, those things that have become so much a part of the way you think that you no longer think about them, and that may only be visible out of the corner of your eye.

You have been prepared to work and to deal with certain kinds of problems in your chosen fields. You certainly have to be able to do that, but there is no question that the most specific things you know, the everyday how-to-do-it aspects of the current practice of your profession, will change most rapidly. You will have to change too, not just to keep current, but to avoid limiting your own personal and career aspirations. I am convinced that you can do that, because I believe that you know much more than you may think you know. I believe that what you really know that is of greatest value "is how to formulate questions and partially answer them, starting from powerful and fundamental points of view" (Abelson, 1994, p. 755). Understanding that may well be the most important thing you take with you from your graduate education. Let me give you some examples.

You almost certainly will have several different jobs in your lifetime, and you may have several totally different careers. You will be continually involved in acquiring new knowledge and in learning, in a variety of ways, to meet your professional obligations and to prepare for new careers and new responsibilities. But the issue goes far beyond work. Think for a moment about the number of roles you will play in which you will be expected to become knowledgeable and to make decisions that will affect your life and the lives of others:

students

faculty in universities and colleges

K-12 teachers

180

roles in business and industry

service providers-in a variety of different fields

administrators

roles in government, including elected representative

consumer

taxpayer

parent

voter

In every case, people will want your time, your advice, your money, your vote, your expertise, your endorsement, and your opinion. Your ability to be a "credible validator of information," to think your way through complex issues and make reasonable and reasoned judgments will be your most valuable asset, and it will have been greatly enhanced by three general aspects of your graduate education.

One is learning to do things. Some of these are very specific, like learning to use a particular piece of equipment or a certain technique. But regardless of your field, you also have learned what might be called "the processes of scholarship." That is, how to define a problem, figure out what the important questions are, decide how to get answers to those questions, prove that those answers are relevant to the problem at hand, and defend your conclusions. You have learned how to challenge or verify the work of others and to have high standards for the criteria of proof.

Another is learning how to get things done. Much of that has to do with motivation, with drive, and with your ability to set priorities and organize your life so that you accomplish what you set out to do. You also have learned to work with other people, to listen, to argue for what you believe, and to negotiate your way through the complicated social and political systems that characterize any working environment. The fact that you are graduating today demonstrates that you have learned that lesson.

Finally, there is learning what things are important to do. There is an old saying that "If a thing's worth doing, it's worth doing well." Over the years, I've heard two variations on that:

The first is that "If a thing's not worth doing, it's not worth doing well."

The second is that "If a thing's worth doing, it's worth doing badly."

The first part of all three statements involves what can be a difficult choice. You have to decide what's worth doing. All three involve making judgments, setting priorities, and taking chances. The last one is my favorite. What it means, of course, is that if you believe something is important, then you ought to try to do it, even if there is a chance that you might not be able to do it well or that

you might fail. It's easy to find reasons for not acting, particularly if the task at hand is difficult or unpopular and the outcome is uncertain. But if you believe it's worth doing, then it's worth trying.

We all make a lot of judgment calls, and knowing when to take the intellectual (and often, the professional) risk is one of the more difficult ones, but one for which you are well prepared.

Graduate education has provided you with some wonderful skills. None of them was a gift, and none was easy to obtain. You earned those skills, just as you earned the degrees being awarded today. You take those skills into a world that none of us could have imagined 10 years ago, and because of what you are, what you know, and what you can become, you will be instrumental in determining what happens next.

I wish you great success, and I hope that every once-in-a-while, particularly when you need to make a tough decision, you will step back for a moment and try to look at the situation out of the corner of your eye. You might be surprised at what you see.

Appendix

A TRIBUTE

to Jules B. LaPidus

We are assembled here tonight to open the 39th Annual Meeting of the Council of Graduate Schools and to celebrate the 16-year tenure of Dr. Jules LaPidus as president of CGS. Tonight we will recognize a few of his many contributions to graduate education. In the process we shall also celebrate graduate education itself.

Steadman Upham, president of Claremont Graduate University and chair of the Board of Directors of the Council of Graduate Schools, delivered these remarks to open the 39th Annual Meeting of the Council of Graduate Schools in December 1999. At the conclusion of his tribute, he announced the creation of the LaPidus Lectureship Endowment.

It's a privilege and a great pleasure to preside over tonight's ceremonies in honor of Jules LaPidus. I first met Dr. LaPidus in 1987, shortly after I had entered the graduate deanery. At that time, Jules had already logged 10 years as graduate dean at The Ohio State University, and 3 years as president of the Council of Graduate Schools. Jules was an experienced veteran who spoke wisely and from a base of great experience. I was a rookie. When I think back on what I didn't know when I began deaning, it is both embarrassing and humbling. Yet even in my first meeting with Jules, he never made me feel uncomfortable about what I didn't know. Instead, he created within me a powerful need to learn as much as I could about the university as an institution and about graduate education as the feature of the university that most promotes academic quality and scholarly excellence. I know that the gift that Jules gave to me then, he also has given to hundreds, perhaps even thousands of other graduate deans over the years. It is the gift imparted by the teacher to the student, and Jules, as one of your students I am grateful for it. My professional association with Jules, and my subsequent 12-year friendship with him has been among the most meaningful and rewarding of my life. I know that I am not alone in feeling this way, that there are many other graduate deans who feel the way I do about Jules. There is no real way for us tonight to comprehend fully and translate adequately Jules' myriad contributions to graduate education. The high points, however, are certainly clear.

ITEM: Jules LaPidus is one of the great visionaries of the modem era about the future of higher education and the development of graduate education. Well in advance of others, Jules has predicted virtually every major development in

higher education for the last 15 years. For example, he was writing and speaking about professionalization of the master's degree in 1976:

> He first wrote forcefully about the need for diversity and affirmative action in graduate education 1980;
>
> He was writing about assessment and evaluation in the early 1980s;
>
> In 1985 he identified the "access-cost-quality" triad that has become the standard framework for thinking about higher education planning and budgets in the 1990s;
>
> He foresaw the 1990s decline in federal support for research in the 1980s;
>
> He first wrote about graduate pipeline issues in 1986;
>
> He was writing and talking about preparing future faculty in the mid 1980s.

And the list goes on. University-industry-government partnerships, international graduate education, the academic job market, the oversupply of Ph.D.s, the crisis in the humanities, postbaccalaureate education, alternative educational delivery models, and lifelong learning—all a decade or more ahead of the time these issues actually began to effect higher education.

ITEM: Under Jules LaPidus' leadership, the Council of Graduate Schools has developed into a membership service organization that has professionalized the administration of graduate education.

ITEM: Jules LaPidus has been an effective steward and spokesperson at every level and has advanced the place of graduate education in the academy.

These and many other major accomplishments have transformed the role of the graduate dean from a part-time avocational position occupied by senior scholars in a sleepy part of the academy into one of the most important and influential jobs in the modern university. This is a profound achievement, to be sure. Yet, as great as are all of the accomplishments just listed, I believe they pale in comparison to the magnitude of Jules' more lasting contribution to higher education. So great is the accomplishment of which I now speak that it will only be truly appreciated by those who look back years from now and ponder how graduate and professional education rose to prominence in the last decade of the 20th century. It is gratifying for all of us in this room to know that graduate education has, among other things, transformed thinking about academic standards, the role of research, the role of the mentor, and academic quality in the university.

Jules LaPidus and the Council of Graduate Schools, the organization he has managed and led for the past 16 years, have brought graduate education into the modem age and into the forefront of higher education. Today, graduate and

professional education, postbaccalaureate education, and lifelong learning are in ascendancy. I have to believe that in no small measure, it is because of the profile and identity of the graduate dean that Jules has envisioned for us and for the way he has helped us all to internalize the mission and values of graduate education. I think there are three reasons why Jules has been so singularly successful as president of CGS.

First, Jules has led the Council of Graduate Schools to build an organization that offers practical information and service to its members about how to run a graduate school. Through workshops, publications, the annual meeting, and now the discussion list, CGS connects with the membership and connects the members with each other.

Second, as I've noted already, the Council of Graduate Schools and Jules LaPidus have been ahead of every major development and trend in higher education during the last 16 years. Jules has provided vision and leadership by carefully promoting specific initiatives and discussion topics that advance best practice in graduate education.

Third—and for me the most important—Jules LaPidus has intellectualized for the graduate deanery:

> the art and science of creating a graduate school that is a resource, not a utility; and
>
> the craft of being and becoming an effective graduate dean.

Most of us entered the graduate deanery because of our success in the world of ideas and in the university. In fact, I have heard other academic administrators say that graduate deans are the intelligentsia of the academy. I've pondered exactly what this means, seeking to avoid failing victim to the kind of disciplinary hubris that often makes graduate deans' lives miserable inside the university. Yet I cannot resist this momentary lapse. The Latin root of intelligentsia (intellegentia) means understanding, knowledge, perception, judgment, discrimination, taste, and skill. These are the very qualities that Jules LaPidus has brought to the graduate deanery, and it explains for me why Jules LaPidus is a dean of deans.

In graduate education and university administration, most of us have found a new world of ideas, a new world of action, responsibility, and opportunity to participate in the process of university building. In this new world, we have also found Jules LaPidus. He has created the intellectual and philosophical rationale for best practice models, innovative programming, and out-of-the-box thinking about diversity, doctoral education and the dissertation, the master's degree, teaching by graduate students, the employment of Ph.D.s, and many other issues. Jules, you have enriched all of us by the way you have intellectualized the fundamental principles of graduate education, of academic leadership, of high standards and professional ethics. Each of your students has, in turn, gone forth

to create graduate schools in this image. More important, we have all carried your philosophy of graduate education into our work.

I am proud to say that your philosophy, translated by the innumerable graduate deans who have benefited from CGS programming and publications, is now woven into the fabric of the modern university. In my view, this is perhaps the most profound and lasting contribution of Jules LaPidus. It is the contribution of a master teacher and one that will not be eclipsed or diminished. The ideas Jules have imparted are now both the structure and foundation of postbaccalaureate learning around the world.

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POST-JULES LAPIDUS:

a look back at a futuristic, yet old-fashioned "humanistoid"

I'd like to preface my remarks by telling you about something that happened nearly 14 years before I met Jules LaPidus. In 1970 when I was in my sixth year as a faculty member at the University of Minnesota, I was invited to address the members of the Department of Chemical Engineering. Now, bear in mind that I was an associate professor of Spanish and Portuguese, yet I was invited to address a group of scientists about some aspect of my own research. And I can assure you that my research was not in the field of chemical engineering, or, for that matter, in any of the sciences. The invitation was proffered by members of that department, namely Kenneth Keller and Rutherford Aris. Ken Keller, when he contacted me, explained that Rutherford Aris, better known as "Gus," although an applied mathematician, was indeed a distinguished professor of chemical engineering. Moreover, he was also an expert calligrapher and paleographer. I told several of my romance language colleagues about these scientists, Keller and Aris, who invited humanists to speak to them about their scholarship. One of my departmental colleagues sagely wagged his head and declared that those scientists were "humanoids."

Russell G. Hamilton dean of the Graduate School and professor of Spanish and Portuguese at Vanderbilt University, presented these remarks at the Council of Graduate Schools Annual Meeting in 1999.

Now, far be it from me, even jokingly, to refer to any human being as a humanoid, because, as we know, humanoid means "resembling a human being." On the other hand, if we consider that broadly defined, the three broad classifications of the academic disciplines are the sciences, social sciences, and humanities, then we have to accept that technically speaking, Ken Keller, Gus Aris, and their departmental colleagues do not qualify as humanists. So back then, in 1970, I came up with another term to characterize them within the context of academia. I classified them as "humanistoids." And this brings me to Jules LaPidus. Down through the years and decades I have used the humanistoid label sparingly, albeit in a laudatory fashion, to refer to academics whose

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disciplinary homes are in the natural and biomedical sciences, engineering, and the social sciences but who often comport themselves like humanists.

In 1984, shortly after getting to know Jules LaPidus I noted that this medicinal chemist had decidedly humanistic interests. By the time we had worked together in the national graduate education community and also had become good friends with a number of mutual cultural interests, I was absolutely convinced that Jules was the quintessential humanistoid.

What in particular, you may ask, led me to confer that honorific—not honorary, but honorific—title on Jules? Well, among a number of things, what especially stands out is language. By this I mean Jules' feel for and love of language. His sense of how language functions in social, cultural, and academic contexts is what, over these 16 years, has helped cement our friendship. In my judgment, Jules' socio-linguistic interests and his ability to deconstruct language and problematize texts have contributed to his outstanding career as a national and international leader and an innovator in the realm of higher education.

To hear Jules speak and to read what he has published on higher education is to appreciate his feel for language, his turn of phrase, his sometimes provocative way with words. "Why Pursuing a Ph.D. Is a Risky Business" is the cleverly ironic title of a point-of-view piece by Jules. And this op-ed article, published in November of 1997 in *The Chronicle of Higher Education,* is indeed thought-provoking. It, in fact, elicited a number of thoughtful letters to the editor. Actually, I learned subsequently that it was the editor, not Jules, who gave that particular title to the article. Jules submitted the article under the title "Ph.D.s and Jobs: A World They Never Made." But I of course, I thought, even though "Why Pursuing a Ph.D. is a Risky Business" is clever and ironic, it is not surprising that Jules LaPidus, the eminent humanistoid, would have opted for a poignant title for an article, which while provocative, was also a sympathetic treatise of solidarity with doctoral students. By the way, Jules, demonstrating his ear for lyrically expressive language borrowed the article's original title from two lines from the twelfth of the 49 *Last Poems* written by A. E. Housman, the acclaimed British poet and classical scholar.

It would seem that as regards poignancy, a keen ear for literary language, and a flair for the provocative, Jules was in especially rare form in 1997. For it was also in that year that he delivered a talk at the Sixth National Conference on the Education and Employment of Graduate Teaching Assistants, held at the University of Minnesota. How's this title for a clever play on "plus ça change, plus c'est la meme chose"? "If We Want Things to Stay as They Are, Then Things Will Have to Change." This particular talk, which begins with a context-setting literary allusion, specifically, to Giuseppi di Lampedusa's *The Leopard*, bears out what I said a couple of minutes ago about Jules' ability to deconstruct language and problematize texts.

After stating that an episode from *The Leopard* put him in the mind of some of the current discussions about the future of universities and especially graduate education, Jules pauses to problematize the title of his own presentation. Remember, the title is "If We Want Things to Stay as They Are, Then Things Will Have to Change." With respect to his thesis, Jules says, and I quote: "Before going any further, it is necessary to define a few terms. First of all, what, in this context, is meant by 'things'? I want to use that to refer to the nature of higher education, and to the role that universities play in people's lives and in society."

Coincidentally, Jules' reference to "nature" and "role" in the foregoing quote reminds me of a discussion he and I once had about, of all things, word order. The discussion was about which of two words should come first in the title of a CGS publication. The two words in question were, precisely, "nature" and "role." Doubtlessly many of you are familiar with the CGS publication *The Role and Nature of the Doctoral Dissertation* (1991). Well, I had the privilege of chairing the CGS task force that developed the recommendations that appear in the publication. I remember engaging Jules in a syntactical and somewhat metaphysical discussion about the booklet's title. I suggested that the title might better read "The Nature and Role . . ." rather than "The Role and Nature. . . . " My argument was based on the assumption that the nature of a given dissertation would dictate the role it played in a given student's degree program. Jules argued, however, that the idea was to establish first what role the dissertation should play in doctoral education in order to determine its quantitative and qualitative characteristics. Although epistemologically a case can be made for either word order, on a causal basis, Jules' syntax does fit the intentionality of the guidelines contained in *The Role and Nature of the Doctoral Dissertation.* My point is that Jules' sense of language helps make him such a clear thinker in the complex world of higher education policy and practices.

Matters of syntax and epistemology bring to mind what I consider to be a masterpiece among the many outstanding articles written and talks given by Jules LaPidus. I should say, parenthetically, that I myself am intrigued by titles, whether those of literary works, doctoral dissertations, scholarly articles, professional addresses, or presentations by public intellectuals. And I can state categorically that one of the most intriguing titles I have encountered in the last several years reads, *Is What's Past (or Post) Still Prologue? or "You Used to be My Used to Was But Now You're My Ain't No More."* This is what Jules titled his talk, delivered on March 26 of this year at Claremont Graduate University on the occasion of the investiture of Steadman Upham as president of that institution. It just so happens that before he came up with that title, Jules informed me of his intention to prepare a talk on the topic. When he zeroed in on the "post" in postdoctoral, I recommended that he read an article by Kwame Anthony Appiah, a name that some of you may recognize as that of the eminent epistemologist and philosopher of language at Harvard and the author of several important publications. As Jules states in his talk delivered at Claremont, a friend (I am

proud to confirm that I am that friend) referred him to an article by Appiah (1991) entitled "Is the Post- in Postmodernism the Post- in Postcolonial?" Using certain epistemological notions of how language functions in social contexts, Jules concocted what I deem to be one of the most profound and enjoyable treatises on the nature of postbaccalaureate and especially postdoctoral education. I think it significant that he should observe in his presentation that "scientists and engineers seek solutions to problems, while humanists tend to celebrate their complexity." In other words, humanists problematize texts. Jules LaPidus, the quintessential humanistoid, or, better, the scientist-humanist, ended his talk at Claremont with an observation worthy of a deconstructionist: "It is one of the paradoxes of language that when we talk about moving to a higher level of education what we usually mean is attaining a deeper level of understanding." What an engaging, Derrida-like play on the paradoxical juxtaposition of "higher level of education" and "deeper level of understanding."

Finally, with respect to Jules' presentation at Claremont, I would be remiss if I didn't comment on the second part of the title, "You Used to be my Used to Was but Now You're My Ain't No More" made me think, first, that Jules has been talking to our colleague and mutual friend Orlando Taylor. Now, you may not know it, but the eminent graduate dean from Howard University was a consultant for the Oakland Board of Education during the debate that took place a couple of years ago about the use of black English, or Ebonics, in that California city's public schools. Orlando, who also has a keen ear for language as well as a sharp and ironic wit, was moved to characterize the debate in the following terms: "To is or not to is, that be the question."

The secondary title of Jules' presentation also speaks to his interest in song lyrics. Let's face it, "You Used to be My Used to Was But Now You're My Ain't No More," even if it comes right out of country music, derives originally from the blues and thus smacks of Ebonic phrasing. More importantly, the secondary title speaks to Jules' eclectic taste in music, albeit with an emphasis on classical and "golden oldies." As for the latter, early on in our friendship with Anne and Jules, Cherie and I learned that he had a kind of obsession with that Jerome Kern classic "I'm Old Fashioned." We discovered that he had numerous recordings with different arrangements of "I'm Old Fashioned." Now, I have to confess that I find that kind of obsession admirable, if not downright magnificent. But what I want to emphasize here is the paradox of a progressive commentator on higher education as an old-fashioned kind of guy. On the other hand, it absolutely makes sense. Being "old fashioned" is in line with the "more things change, the more they stay the same" and Jules' paraphrase of what another one of his friends proclaimed "when elements of the past or present are uncritically superimposed upon visions of the future, they can impoverish the potential of what we hope to do and lead us to disregard what is good and useful about what we have done." Hear, hear for good old fashioned progressiveness!

I could regale you with many more stories and anecdotes about Jules' preeminence as a man of refined humanistic tastes. But I'll end by noting that last night I commented to Jules that I had to go back to my room in order to polish up the remarks I was to make this morning. Jules said, "Why don't you deliver your remarks in Portuguese?" So I feel perfectly at liberty to interject a few words in a language that perhaps, among those gathered here this morning, only Jules, his wife Anne, and certainly my wife Cherie, Yolande Zahler, our good Brazilian friend from the Africa-America Institute, Gordhan Patel, my lusophone colleague and the dean at the University of Georgia, and Maria Fátima de Lima, also a Brazilian and the graduate dean at Meharry Medical College, will comprehend:

> Queridos Jules e Anne, no nome da Cherie e no meu próprio nome, muito obrigados pela camaradagem e apóio infalível ao longo destes 16 anos de amizade.[11]

Jules LaPidus is about to enter a post-CGS era. Let me say, however, that for his many, many colleagues and friends this era will not be one of post-Jules LaPidus.

[11] Dear Jules and Anne, on behalf of both Cherie and myself, thank you for your camaraderie and unfailing support throughout these 16 years of friendship.

our JULES *our Savant*

Notoriously, important elements of graduate education have been compared more than once to marine mollusks. William James said the Ph.D. was an octopus. Theodore Ziolkowski, a legendary Princeton graduate dean, said it was a squid. The question is open as to whether this analogy is more unfair to the doctorate or to the highly developed cephalopods. I can argue either side, depending on my mood. Inarguably, the existence of these metaphors has stimulated me to think of an appropriate one for Jules LaPidus. The clam? No. Jules has not lived in a shell. The cuttlefish? No, no. Jules has neither waved ten arms nor secreted dark, inky fluids. The shark? No, no, no, no, no, no, no. Jules is the opposite of a blood-thirsty fish of prey. Instead, Jules has been our dolphin, our wise and friendly, intrepid and humorous, our sweet swimming guardian of a dolphin.

Catharine R. Stimpson, dean of the Graduate School of Arts and Science New York University, also presented remarks at the CGS Annual Meeting in December 1999. She comments on several pieces included in this volume.

Jules has given so much to education in general and graduate education in particular that it is the easiest of tasks to point to specific achievements. Let me bring up but three of his gifts. The first has been his dolphin's presence, the plain grace and goodness of the man. He has been a leader, but he has never confused leadership with arrogance. On the contrary, he has been civil, patient, modest, honest, witty, and humane. He has led and presided over institutions, but he has never succumbed to the comforts of being bureaucratic or conventional. On the contrary, he has been far-sighted, clear-sighted, and wide-sighted. Seeking to open institutions up, he has embodied a pluralistic, democratic, and inclusive spirit. Often called upon to speak, he practices the rhetoric of pluralism. That is, he prefers conversation and dialogue to monologue. Although he is keenly aware of life's quirks and follies, he serves the cause of reason, both soberly and whimsically. In a recent paper on postbaccalaureate futures, *Broadening the Scope of Graduate Education: Postbaccalaureate Futures*, he fears a paucity of "flashes of reality or rationality" in thinking about higher education. About 2 decades earlier, in 1979, then the vice provost for research and dean of the graduate school at Ohio State University, he gave a speech to an annual meeting of the Council of Graduate Schools. His subject was graduate education at his home

institution. Although a scientist by training, he turned—as he often does—to literature for inspiration, more specifically to Alfred Lord Tennyson, "The Charge of the Light Brigade." In this bombastic and patriotic old chestnut of a poem, the light brigade—600 hundred strong—rides into the Valley of Death. "Theirs is not to reason why, Theirs but to do and die," the poet cries. Is this, Jules asks wryly, the signature poem for a graduate dean? Ultimately this man of hope answers his own question in the negative. Reversing Tennyson, he concludes:

> Ours is not to do or die,
>
> But always to try to reason why.

Jules' second gift has been to describe the history, structure, processes, and demographics of higher education, especially graduate education. Not surprisingly, given his devotion to reason and his own reasonableness, he has done this factually, lucidly, and systematically, and taken on two roles. First, he has spoken within the family and told those of us in higher education who we are, where we have been, and where we might be going. Next, he has told others about the family. He has explained what higher education is, where it has been, and where it might be going. He has been a well-informed, judicious ambassador to the press, government, and the public—in the United States and internationally. He has been alert to the changes that higher education is both generating and experiencing, the evolution captured in the conviction that we are moving from "graduate education" to "postbaccaulaureate futures." Among them are changes in the composition of our student bodies, the aging of the American work force as well as of the American student force, changes in the roles and rewards of faculties, the fragmentation of the curriculum, changes in the nature of the degrees and certificates we are offering, changes in our delivery systems and providers, the fascination with globalization, and new technologies. He is, it is important to note, neither a utopian nor a dystopian about these technologies. He reminds us, for example, that the university can dwell, and has dwelt, in a variety of habitats. A virtual university will simply add to this diversity. Because Jules has carried out his descriptive obligations so faithfully, his papers will be helpful to historians of American education in the future. They will be able to trust this man—as we have been able to do.

If Jules' second gift to education shows the reasonable man in action, the third shows the good man in action. Although he has described higher education well, he has never permitted himself to be an empiricist only. He has had ideas, and feelings, and responses, and attitudes about education. He has worried about us. He has feared that we will be frightened by change. If we let change scare us, we will be suffer from a double incapacity: We will be both incapable of changing if we should change and incapable of controlling change if it seems to be getting dangerously out of whack. He has been anxious that we will reduce our general obligation to serve society by becoming a cog in a scientific-economic machine. One reason why he worries is because he cares deeply about education and

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because he is an idealist about it. Jules is no zealot, but he has been zealous in reminding us of what good we might do, and how good we might be. He is pragmatic, but he has had aspirations for education. The end of the essay, *Broadening the Scope of Graduate Education,* crystallizes his idealism. He declares that we must find the core values of graduate education and never despair in our quest. He writes, "We are in this business of graduate education because we believe in it, and love it and want to make it better." Then, with a pinch of his salty wit, he adds, "The trick will be to 'keep our heads while all about us are losing theirs and blaming it on us.' But that's the job description of the graduate dean."

Together, Jules' papers and essays provide a moral blueprint for [illegible]raduate schools. If we were to build our graduate schools according to this blueprint, they would be cosmopolitan and pluralistic in membership, ideas, and spirit. So would our professional organizations. Jules calls on academic communities to mobilize public opinion on behalf of these virtues. He is very wary that we might submit to provincialism or multiple chauvinisms. He has championed access and success for women of all races and minorities of both genders. He has also supported international students and argued forcefully against stereotypes of the international student as the bumbling, tongue-tied TA who is miseducating American boys and girls. Interestingly, in the late 1990s, he begins to supplement his interest in international students in United States universities with an analysis of the ways in which universities internationally are becoming more like those in United States. Our exceptionality has helped to make us a viable global model.

Our cosmopolitan and pluralistic institutions would be self-conscious and self-aware. First and foremost, they would have a solid sense of their core purpose. If we know why we exist and why we matter, we will be able to devise, and then to defend, standards of quality. The need to measure quality is one of Jules' constant themes. A famous and famously outspoken mayor of New York City would obsessively ask his constituents, "How'm I doing?" We must as fiercely ask ourselves, "How're we doing?" It is easier to do this if we have fundamental values that are moral and intellectual compasses. Institutions of higher education may have specific missions. Indeed, Jules foresees that they will become increasingly differentiated. However, for Jules, the university is, in its brain and heart, a place of impartiality and learning. In graduate schools, learning is advanced and focused. Over the years, he has seen greater and greater pressure on higher education to produce short-term results. This has led him to be an even more passionate advocate of scholarship. Crucially, he distinguishes between scholarship and research. He writes, "Research is something you do; scholarship is the way you think about it" (LaPidus, 1996, p. 3). Although he respects research, he urges us towards scholarship as he defines it. This means that he implores us to think, to ask about the why of things, to be conceptual as well as operational, to seek knowledge as well as information. Not surprisingly,

he supports interdisciplinary activity. In person, and in his writing, he is willing to explore several fields. This scientist quotes European and Victorian novels and finds metaphors in archaeology. Interdisciplinarity encourages us to make connections among the things that we might learn and know. Interdisciplinarity also forces us to ask how and why we organize knowledge as we do.

Correctly, Jules refuses to separate scholarship and teaching, which disseminates scholarship and research. The university must be a place of both. One purpose of teaching, he reminded a Modern Language Association conference in 1985, is to inspire students to become scholars and researchers so that they will replace and replenish their teachers, so that they will become the next generation of guardians of the university. If we do not teach well, if we are cynical or indifferent, we will be the sterile endpoint of learning. As correctly, he refuses to separate a scholarly institution from a socially responsible institution. However, scholarship is itself a form of service. For a scholarly institution will graduate, not narrow technocrats, but people who possess both lively minds and the desire to live responsibly in the world. His humane vision of what university graduates can be like combines elements of the 19th century theories of higher education that have so shaped 20th century institutions: those of Cardinal John Henry Newman, of the founders and developers of the American land-grant universities, and of the founders of the German research university. Jules unswervingly believes that we can and must ensure that "people who learn in universities have a broader vision of their world, a brighter view of its prospects, and greater expectations of their own ability to make a difference" (See *Great Expectations*).

Jules' commitment to scholarship influences his definition of what postbaccalaureate degrees should be like. He has staunchly supported the master's degree and the graduate institutions that focus on them. He argues plausibly that the master's degree serves new and emerging needs among learners. However, he writes of a degree that connects research and professionalism. He is also aware of the movement to measure the strength of a doctoral program by measuring its ability to "place" its newly-minted Ph.D.s in jobs. But he defends the Ph.D. for students, even if it is a "risky business" that might not lead to a tenure track university job as inexorably a river leads to the sea. For the doctorate trains minds that are able to go in several different directions. Graduate schools, he writes, should prepare a student for research, scholarship, careers (be they in the academy or industry or elsewhere), and, finally, for life.

In his more recent essays and papers in the late 1990s, Jules has discovered the prefix "post." This grammatical unit is a pervasive mark of our immediate period. The frequency of its use suggests that we have no certain name for ourselves, no fixed and common identity. Instead, we can only name ourselves by saying that we are different from what came before. Thus, we are

postcolonial, post-Gutenberg, postmodern, postcomputer, post-Internet, or postbaccalaureate. In a few months, we will be blessedly postmillenial. These post-it messages about our identity signify our belief, and his, that we know we have changed from the past, but that we are not sure what we will change into, what we are changing into, what we have changed into. The Council of Graduate Schools, and we graduate deans, are moving into a post-Jules age. Things will be different without him, but we cannot predict exactly how. We will be different without him, but we cannot predict exactly how about this as well. I hope that we will carry two things with us into the post-Jules age in graduate education. The first is his insistence that universities and graduate schools have a set of core values, his belief that universities are "more about education than training, more about knowledge than information, and, ultimately, more about scholarship than research." This quotation is from his essay cheerfully, and satirically, entitled, *Is What's Past (or Post) Still Prologue? or "You Used To Be My Used To Was But Now You're My Ain't No More."*

What we must also carry into the post-Jules age is our gratitude to him. There is a story in classical folklore about a musician who sets sail. The crew of the ship on which he is travelling intend to murder him for his money. He begs to sing one last song. When he is done, he leaps overboard, and there, tossed amidst and by the waves, he is rescued by a dolphin who has come to listen to his music. The dolphin escorts and ferries him to safety. Once on land, the musician awaits the arrival of his would-be-murderers, and then hands them over to the authorities for punishment. Jules has listened to the music of thought and humane education. He has rescued many in education and led us to safety. Few do so much, and with such buoyancy of heart and stability of conscience. Jules, thank you.

IN HONOR OF *Jules LaPidus,*

colleague and friend

I am pleased and honored to have been invited to join you today in saluting your departing leader. Unlike so many educational leaders these days, Jules LaPidus has managed to leave with his shield, not on it. By itself, that is a major accomplishment, and eloquent testimony to his successful tenure.

One reason why it is so difficult for leaders in higher education to leave office gracefully can be found in one common response to a job change that leads them to high office. It is only a slight exaggeration, I think, to say that many faculty believe that when a colleague becomes an administrator at any level above that of department head, a change takes place that is much more than a change in title and job description. It is, in the view of many, a change of sides that either stems from or produces a serious characterological defect—maybe a whole collection of them. By the simple act of changing jobs, a trusted colleague and friend can become an adversary, representing a different and potentially hostile set of interests.

Robert M. Rosenzweig, president emeritus of The Association of American Universities, offered these remarks at the December 1999 Annual Meeting of CGS.

I am aware of only one exception to the rule. When a faculty member becomes a graduate dean, the change is all for the better. Only the finest are chosen, and the mantle of graduate dean, itself, confers a sweetness and nobility of character that stands alone in our universities. I know that to be true because Jules LaPidus told me so, and I have learned in the last 15 years to believe anything Jules tells me. Well, almost anything.

I suppose I should explain that I never had the privilege of actually seeing Jules perform as a graduate dean. I met both Jules and Anne at a reception CGS gave for them following Jules' appointment. It was at the Cosmos Club, and fortunately by then the Club rules allowed women to enter the building by the front door. As I recall, they had spent the day house hunting, and they were suffering a severe case of sticker shock. Even in 1984, owning a house in Columbus was not a great help in the Washington market. I remember that, for some reason, Adelle, my wife was not able to attend, but when I got home I recall saying to her that I had just met two people who I knew were going to be good friends.

How did I know that with such certainty? Well, I had been in Washington for about a year, and what I had discovered was that, while the educational

associations were full of people who had been on a campus at some point in their careers, there were not many whom I would describe as real academic types. Don't ask me what that is; I just know it when I see it. I don't intend by that observation any invidious comparison. It is simply a fact that when people have spent enough time in Washington, even though their business is education, they are no longer academic people. No doubt the same thing happened to me after 10 years, but I am proud to say that I recognized in Jules someone with whom I instantly identified.

I was right, of course, and the four of us have spent many wonderful hours, days and weeks together in various parts of the globe. But I am an honest observer as well as a friend, and this is an occasion that calls for at least a measure of honesty. So in that spirit I would like to make some observations first about Jules as a person and then about Jules as an educational leader. Both of those are arenas in which I have had ample opportunity to watch and evaluate him.

First, Jules the person. Those who know him at all know that Jules is a collector. I am tempted to say that he will collect anything that isn't fast enough to get out of his way, but that would not be wholly true. In fact, Jules is quite discriminating in the categories of things he collects; it is only within those categories that he tends to be indiscriminate. Once he hits on some category of things that interest him, he has to have every single example of the members of the category, and often more than one. Moreover, he has to know everything there is to know about it. For example, when my wife and I first visited the LaPiduses in their home, I was stunned at the size of his collection of LP records. Surely, he had at least one of everything, and for any piece of music he liked, he had collected just about every version ever recorded. Indeed, within truly specialized categories, such as, for example, the American standard popular song "I'm Old Fashioned," he literally had collected every version ever recorded of the song, and I want to tell you that some of them are really weird.

But somewhere along the way, he lost interest in LPs and turned his attention to CDs, a technology he had first scorned as unworthy of the high-end audio equipment he had also collected. He proceeded to reproduce his entire LP collection on CD, and added substantially to it, since, of course, the new technology produced a whole new set of recordings. Since I have known Jules, he has turned his attention to single malt scotch whisky—an interest from which I have derived great pleasure—Italian wine, and most recently, the prints of a great Japanese print maker whose work now covers virtually every previously blank piece of wall space in their house, including some places where you might not expect to see fine art. Anne, for her part, not wanting to be left behind, accumulated a wonderful collection of fine perfume bottles, which she recently had the good sense to sell. I was always nervous about that collection, because in the San Francisco Bay Area where I live, a collection of fragile glass objects wouldn't have a long life expectancy and would be very hard to insure.

I have thought a lot about this collecting urge. The words that come most readily to mind are obsessive, compulsive, tunnel vision, and they probably apply to many collectors. But really, none of these fits Jules. I think, rather, that two impulses drive Jules to collect. One will be obvious from the list of his targets—just plain hedonism. He collects things that give him pleasure, with the idea of consuming them, in one form or another, rather than saving them and watching them grow in value. But more than that, Jules' impulse to collect grows out of a true scholar's need to know—he has wide ranging interests and the need to know as much about as many of them as he possibly can. That is not pathology, unless the impulse to learn is pathological.

I have devoted so much attention to this part of Jules's life because I think it is seamlessly attached to his professional self. The same need to know that leads him to seek out obscure renditions of "I'm Old Fashioned" also informs his work and has led him and the Council of Graduate Schools down some roads that other groups that are concerned with graduate education have spurned, one might even say scorned. I think that, as time goes on, that venturesomeness, that willingness to follow new lines, learn as much about them as possible, and then make constructive use of them will be recognized as Jules' greatest contribution to American education, and it will be seen as a large one.

So let me turn now to Jules the leader of an important educational association. Here, too, I can draw on personal experience. I have some personal knowledge of how hard it is to move an organization whose members are numerous, distant, busy with their own affairs, and certain that they know as well as you how you should do your job. Equally to the point, as president of the Association of American Universities I was also responsible for its adjunct, the Association of Graduation Schools. The relationship between AGS and CGS has always been a little odd. The creation of CGS grew in part out of the unwillingness of AGS to take a more active role in influencing the growing government presence in graduate education, as well as AGS' limited membership, which excluded a significant fraction of doctoral-granting universities, not to mention the very large number that did not have doctoral programs but were nonetheless deeply engaged in graduate education. When Jules arrived at CGS in 1984, I think it is fair to say that AGS thought of itself as the elite organization, and CGS was viewed as a kind of blue collar group. That in spite of the fact that almost all AGS members also belonged to CGS. I think it also fair to say that CGS was more useful to its members than AGS ever attempted to be to its members.

When Jules and I began to work together, itself a novel arrangement, I learned that one of his more galling frustrations came from the attitude of some foundations that were logical targets for fund-raising. To put it bluntly, the same foundation officers whom I could call, and from whom I could expect at least a return call and as often as not a favorable response, gave Jules and CGS the cold shoulder, for a reason that I think can be described as snobbery.

Now it is certainly not news that higher education in America lies somewhere between England and India in its delineation of castes. But, we have a way in this country of redeeming some of our worst defects. This particular defect is often redeemed by the power of meritorious performance. And so it was in this case. By his instinct for recognizing important developments before most people see them coming, by the force of his intellect, and by his powers of persuasion, Jules turned the status hierarchy on its head. There is no doubt now that CGS is the preeminent organization in the field of graduate education. It got to that place by taking on the important issues and doing more than just talk about them. It has been a leader in bringing recognition to the once humble master's degree. In partnership with the American Association of Colleges and Universities it has put together the best program anywhere for introducing graduate students to the job and the pleasures of teaching in institutions that are different from the ones in which they are studying. And even more recently, together with the University Continuing Education Association, it has begun to take a hard look at what distance learning does and does not have to offer the graduate education enterprise. While undertaking these initiatives, CGS under Jules' leadership also enlarged and enriched its summer workshops, its annual meetings, and its data gathering and analysis. The old problem of getting people with money to answer his calls and letters has certainly been solved; now he has to beat them off with a stick.

Coming from me, it may sound like self-interested testimony to say that running a national educational association is not an easy job—at least not if you want to do it the way it should be done: with energy and integrity. The world of higher education is not a seamless whole in which all parts fit together to produce a harmonious garment. On the contrary, as we all know there are often sharply conflicting interests, with elbows to match. For every suggestion of how to move forward, there are a hundred critics with better ideas and a pocketful of arguments proving that your suggestion is misguided, dumb, or maybe even evil.

Perhaps, as I suggested at the outset, graduate deans are really different from anyone else. Well, I'm sure you're easier to work with than a comparable group of presidents. But I hazard the guess that you're not perfect. Where you have approached perfection these last 15 years is in having a well nigh perfect leader who could take you where you needed to go with a rare combination of intelligence, wisdom, dignity and, not least of all, good humor. It has been my good fortune to have had him as a friend and colleague, and yours to have had him as your leader.

There is only one respect in which I must question Jules' judgment: As he moves forward into a life that will consist of the company of his wife, good books, good movies, good music, and good scotch, I wonder only what the devil took him so long to make the move.

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This listing highlights a selection of the author's major works related to graduate education and higher education. Citations for other pieces, including more than 40 publications in the field of medicinal chemistry, may be obtained from the Council of Graduate Schools.